RUSS OLSON VOLUME 23

MESABA RAILWAY COMPANY

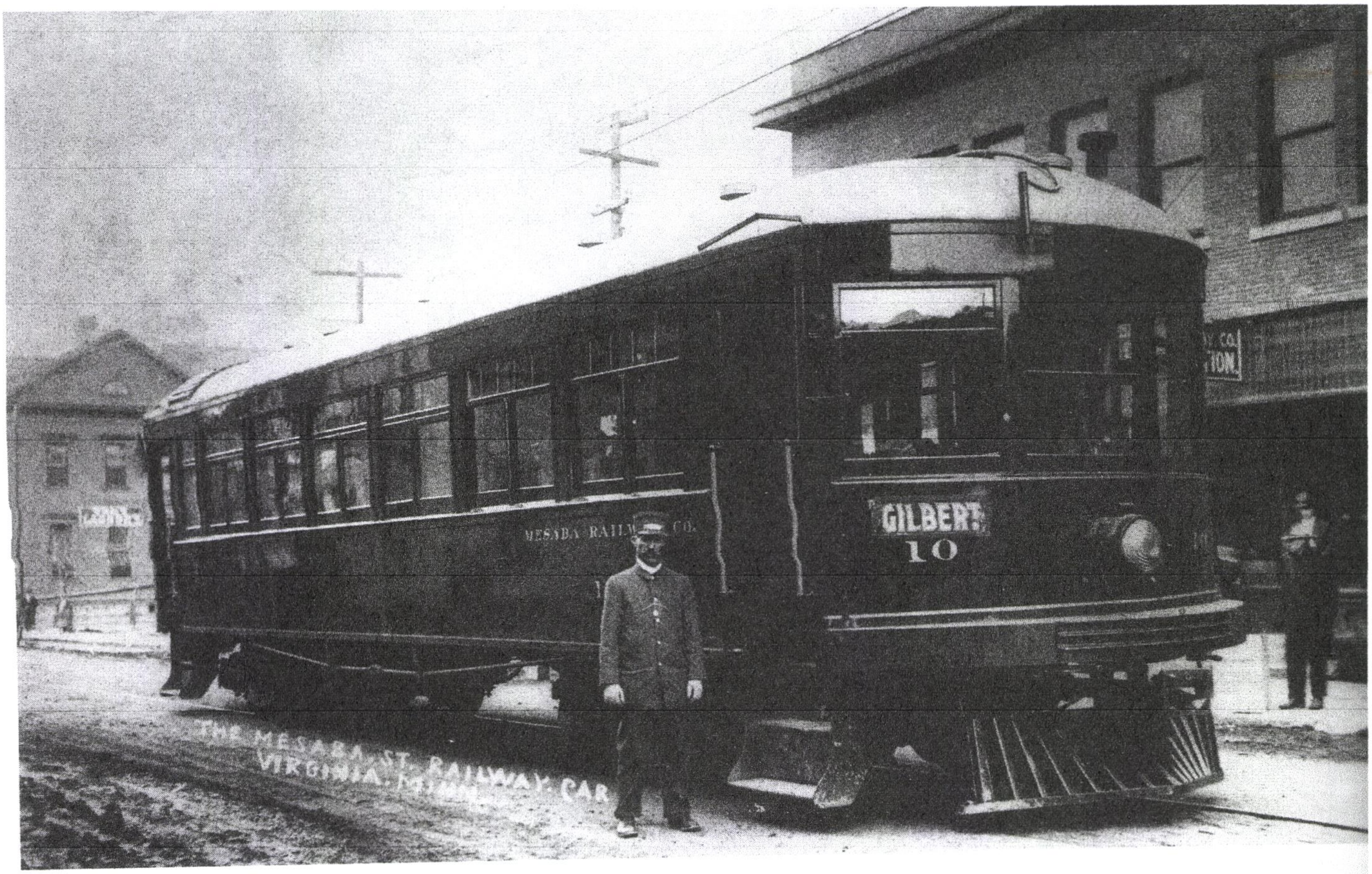
Description

History, finances, track maps, photos, and equipment for the Mesaba Railway Company.

Sub-divisions Within This Volume

- Contents of the Front Pocket
- Mesaba Railway Co., Hibbing to Gilbert, 1912 to 1927
- Contents of the Back Pocket

CONTENTS OF THE FRONT POCKET



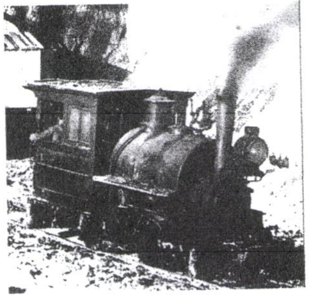
A Mesaba railway eastbound trolley pauses at Virginia-Center Station on Wyoming Avenue (Third Avenue today) in 1914. VOSS COLLECTION, IRON RANGE RESEARCH CENTER

north side. From there, the track was extended in two directions, west to Hibbing and east to Gilbert.

An electric trolley system was put together and two 600-volt, steam-driven generators were set up close to the Virginia and Rainy Lake Mill, where chips and shavings could be used as a cheap source of fuel. A conveyor from the mill fed directly into the power station's firing room and water for steam was drawn from Silver Lake. Substations were established at Gilbert and Chisholm and, after 1921, at Hibbing.[10]

The streetcar made its first run between Virginia and Eveleth on December 24, 1912, and by the end of January, hourly service from 6 a.m. to midnight extended across the line. From Virginia, fares were 10 cents to Eveleth, 20 cents to Gilbert, 5 cents to Parkville, 10 cents to Mountain Iron, 25 cents to Buhl and 50 cents to Hibbing. The response exceeded all expectations. Soon everyone was riding the streetcar: mine inspectors, mothers with children, businessmen, salesmen, shoppers from the locations, men in search of work and miners on their way to work.[11]

During shift-change, two-car trains jammed with miners ran the length of the line. On weekends and holidays, three-car trains were sometimes used. During weekdays the heaviest traffic was always between Eveleth and Virginia.[12] But there were Saturday nights in summer when pub dances at the Sparta Pavilion on Ely Lake drew record streetcar crowds.[13]



“The cars often reached speeds up to 40 miles an hour and there were times when people, cars, trucks, cows, chickens and ev other trolleys got in the way … demerits were issued to a conductor taking a car fro the barn without a cow catcher.”[14]

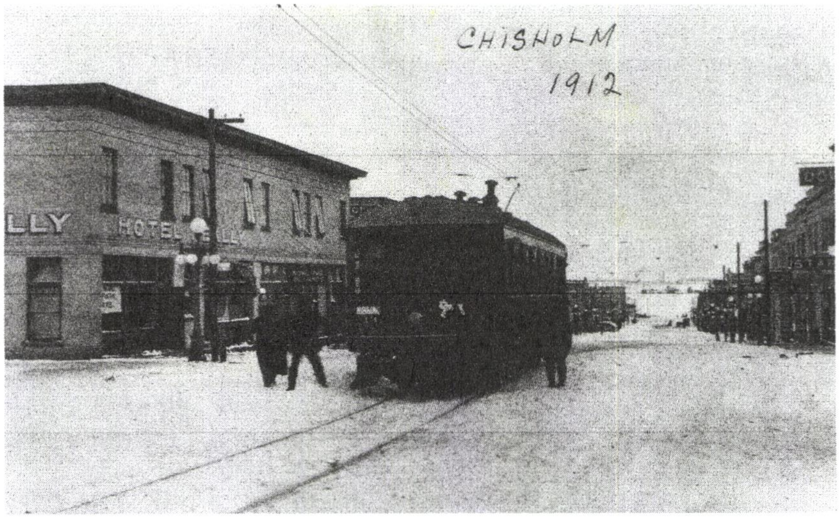
The electric railway was 30 miles long and there were 46 stations along the route that is, if you count the ice cream parlor n the corner of Wisconsin and Broadway in Gilbert. There, the street car turned aroun and became a “westbound.” It then proceeded on through Genoa Location an Station 44 to Eveleth, where it turned nor on Adams Avenue and continued on to Virginia.[15]

Virginia had more streetcar track than any other town on the line. It was here, between Virginia Center and Northside Station, that streetcars were often the mos crowded. West of Virginia the streetcar passed through Parkville, Mountain Iron, Kinney-Spina Station, Lucknow Location and entered Buhl along Culver Avenue. A op at the Buhl Drugstore, it proceeded to Chisholm. After a number of stops at ions along the line, it rumbled into isholm along a 2,000-foot wooden trestle oss Longyear Lake. At the substation on e corner of Chisholm's Central Avenue and st Street, there was always a crowd of iners at shift-change waiting for an astbound" or "westbound" to appear.

The run from Chisholm to Hibbing was rough a "no man's land" of mines, dumps d locations. Although the distance tween the two towns was short, here the ack was long. The streetcar had to wind its ay through an extremely active mining area fore it could make its final stop at ibbing's McKinley Street Station.[16]

Continued mining forced both Hibbing d the streetcar line to relocate. A 90-day ncellation clause in the streetcar's right of ay contract with the Oliver was enacted in 19. New track was laid and a substation d terminal building built at the corner of xth Avenue and Howard Street on the new wnsite. After 1921, the streetcar passed by len Location and ran through Kitzville and rooklyn before entering Hibbing at oward Street.[17]

When first established, it was planned at the Mesaba railway would span the tire length of the range from Aurora to Grand Rapids. The incorporators also hoped to deliver electricity to every town in the mining district. It didn't happen. Rapid development of motor cars, all-weather roads and efficient hydroelectric plants ended plans for expansion. By 1921, the company was operating in the red. On March 7, 1924, it went into receivership and on April 16, 1927, the last inter-urban streetcar made its final run.[18]

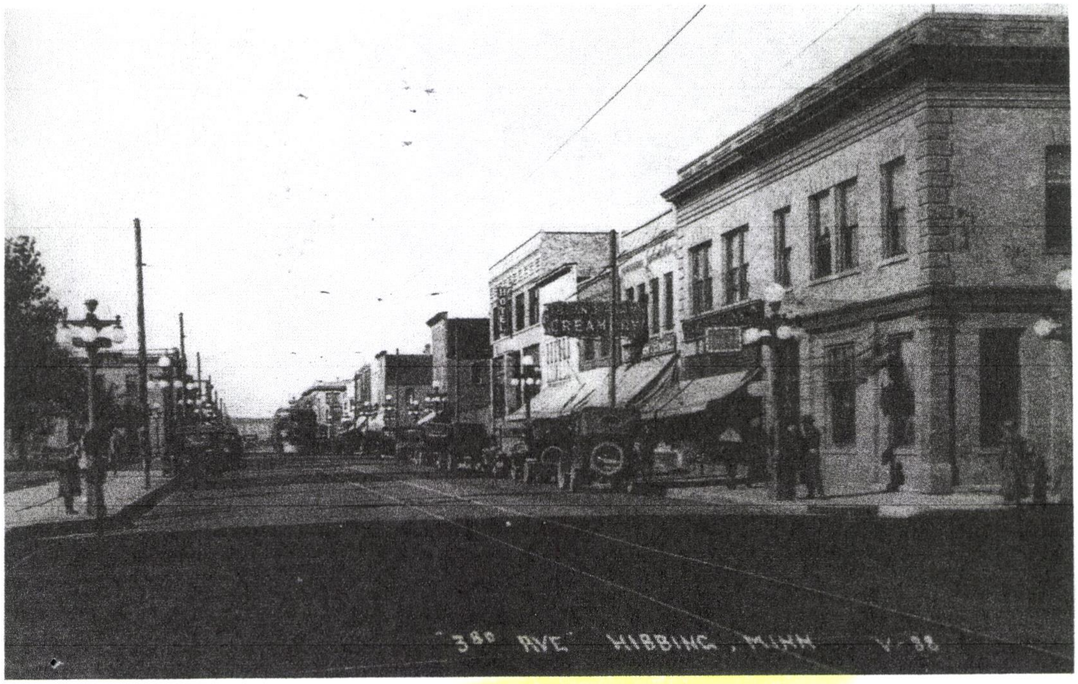


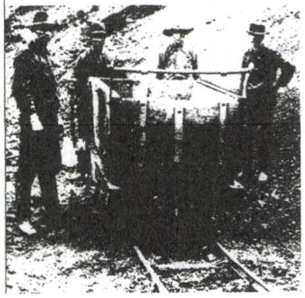
A Mesaba railway westbound on Chisholm's Lake Street. COSTANZI COLLECTION, IRON RANGE RESEARCH CENTER

Bottom: An Inter-urban streetcar passes down Hibbing's Third Avenue on its way to its final stop at McKinley Street Station. VOSS COLLECTION, IRON RANGE RESEARCH CENTER

Mesabi Bus Companies and the Greyhound

When Andrew Anderson, former diamond driller turned car salesmen, found that he couldn't sell the first car shipped to his Hibbing Hupmobile agency, he began using it to sell rides to nearby locations.





d administration that has brought other nge places into high repute. Kinney has cellent schools, has an up-to-date lighting stem with an adequate 'White Way,' is ll-paved and has a good sewerage system. has a well-patronized state bank, some od stores and some fine residences."[12]

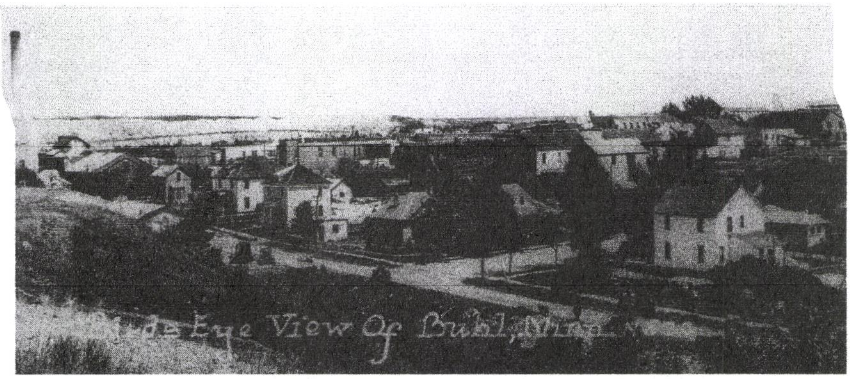
It was Buhl that expanded and prospered e most. Although its population barely ceeded 1,000 in 1909, the village was eady on its way to becoming an important esabi town. On the site were nearly 100 wly built homes, several boardinghouses, a y hall, firehall, two good hotels, several ocery stores, department store, confectionery, v office and eight saloons. By 1910, the wn had an electric light plant, piped-in am heat for all of its buildings and one of e best water systems on the range.[13]

During the next 10 years, the town grew nificantly; village limits were expanded, sessed valuation rose to almost $10 illion, tax money flowed in, streets were ved, a magnificent high school was built d both population and retail trade doubled.

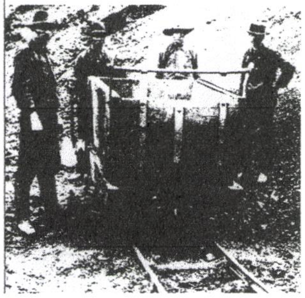
In 1916, *The Buhl Advertiser* boasted oudly, "There is little doubt that Buhl is coming into its own and the day for good business conditions for Buhl is here...."

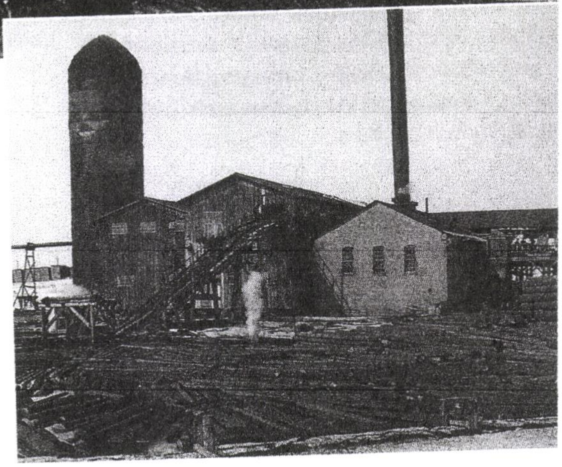
Not all of the good business was due to mining. In June 1914, the U.S Supreme Court handed down a decision prohibiting the sale of liquor in territory created by the Chippewa Treaty of 1855 and the following November Cato Sells, commissioner of Indian Affairs, ordered the closing of all bars and saloons in the treaty zone. Sixty-one Minnesota communities were to be affected by the decision, including the Iron Country towns of Chisholm, Hibbing, Keewatin, Nashwauk, Taconite, Calumet, Marble, Bovey, Coleraine, Grand Rapids, Deerwood, Crosby, Ironton and Cuyuna.

Buhl, located just outside the treaty territory, was not. However, "the lid," as it

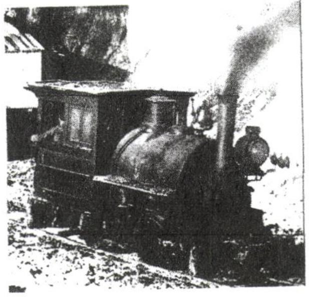


For a time Buhl, with its paved streets, waterworks, electric lights and modern buildings, was one of the leading range towns. Photograph taken in the early 1930s. VOSS COLLECTION, IRON RANGE RESEARCH CENTER **Bottom:** Buhl was already a well developed town when this photo was taken in the early 1920s. IRON RANGE RESEARCH CENTER





On November 25, 1903, at the grocery store of Knuti and Ongala located in a small cluster of buildings just off the Mesabi Trail, 38 votes were cast to incorporate the Village of Aurora. **Bottom:** The Skibo Timber Company located on the St. Louis River east of Aurora provided much of the lumber for the growing town. Photograph taken in 1918. NUTE COLLECTION, NORTHEAST MINNESOTA HISTORICAL CENTER



was called, did not close immediately – nor did it close equally. Led by Hibbing Mayor Victor Power, village councils in Hibbing and Chisholm managed to delay the closings for a year, but on November 29, 1915, 71 liquor establishments in the two towns were shut down by federal order.[14]

The number of saloons in Buhl doubled, and for almost five years the town was packed nightly with hard-drinking crowds from Chisholm, Hibbing and other places in dry territory – some from as far away as Nashwauk. They came by rail, riding the Mesaba Railway's electric streetcars and by automobile and bus from Hibbing along the newly built Babcock Highway. There were so many people in the bars of Buhl that "bucket brigades" had to be formed to get the filled glasses of beer from bartenders to customers located "back out in the crowd."[15]

Because streetcars and buses were also used to transport liquor into dry territory for resale in the back rooms of newly established soda pop parlors, they were soon monitored by federal agents. By this time, an inordinate amount of traffic had worn down the road between Buhl and Chisholm. The town's reputation for fun and frolicking was suc that the west-bound trolley from Mounta Iron was packed with merrymakers from towns that were not even affected by the ban. Then, on January 1, 1920, the 18th Amendment and Prohibition put a sudde end to what was probably the most prosperous time in Buhl's history.[16]

Despite the sudden loss of income, i was said in 1921, "Buhl has much of whi to be proud. Its municipal building, libra park and school system rank with the bes be found on the Mesabi Range.… Buhl, with its paved streets, water works, electr lights, beautiful schools and churches,

MESABA RAILWAY CO.

HIBBING TO GILBERT

1912 - 1927

MESABA RAILWAY CO.

HIBBING to GILBERT

1912 - 1927

GENERAL HISTORY

The first of the vast iron ore deposits of north central Minnesota called the "Mesabi Range" were discovered by the three Merritt brothers of Duluth near Mountain Iron in November 1890. The first trainload of iron ore from this mine arrived in Duluth during October 1892. Mining activity increased rapidly as discovery of high-grade ore deposits continued. The range eventually became the world's largest source of iron ore. Cities and "locations" (as the mining settlements were called) grew rapidly also, the population largely made up of the laborers in the open-pit iron mines. By 1910 the population of the several cities was recorded as: Hibbing 8,832; Chisholm 7,684; Buhl 1,005; Mountain Iron 1,343; Virginia 13,671; Eveleth 7,036; and Gilbert 1,700. The total population of the area exceeded 55,000. Although the area was served by a network of steam railroads, none were interested in the passenger business as the ore and lumber tonnage was substantial and profitable. One road did furnish passenger service between most of the important cities but transfers were necessary at junction points on an indirect route and long delays between trains were frequent. There was a natural inter-communication between the "locations" and the cities and despite the inconvenient service there was a large amount of passenger traffic. Thus the possibilities for an electric railway through the area were considered excellent.

Two rival groups were seeking franchises from the various cities for an electric railway during 1907. In June of that year it was reported that the Northern Traction Co. of Hibbing had secured franchises in Hibbing, Chisholm and Buhl, while the Mesaba Traction Co. of Virginia had been equally successful in Virginia and Eveleth. Apparently neither company undertook actual construction.

The Mesaba Railway Co. was incorporated 11-15-1910 in Minnesota. The Mesaba Electric Railway Co. was incorporated in January 1911 and was authorized to do business in Minnesota in February 1912 as a holding company and acquired all the capital stock of the Mesaba Railway Co.effective 3-1-1913. Boston financial interests were the chief investors. Many prominent Minnesotans from the Iron Range communities and Duluth acquired capital stock: W. P. Chinn, Samuel J. Cusson, Richard Chinn, Dr. E. H. McIntyre, John D. Lamont, Chester H. Rogers, Dr. Dana C. Reed and Albert B. Coates. The first officers of the Mesaba Railway Co. were: Oscar Mitchell, Duluth, President; Robert Watson, Philadelphia, Vice-President; Philip L. Saltonstall, Boston, Treasurer; and Henry S. Newton, General Manager. C. E. Thomas was Chief Engineer during construction of the railway.

The engineering force was organized and began surveying during 1911. Track laying began in early July 1912. The first car to operate over the newly completed line began providing hourly service between the Virginia carhouse and Gilbert on December 24,1912. On Christmas Day two-hourly service was begun between Buhl and Gilbert. On January 22,1913, regular hourly service from six a.m. to midnight daily was inaugurated over the entire line from Hibbing to Gilbert.

A territory almost as rich in iron ore deposits which abounded in "locations" and growing towns lay both to the east and west of the existing terminals of the line. It was intended to extend the line to serve these communities and to ultimately develop a power and lighting business in the entire territory. However it was announced on February 16,1913, that construction of the projected westward extension to Grand Rapids would be delayed for some time. No additional construction was ever undertaken. During 1916 a bus line began operating beteen Virginia and Aurora. The Mesaba Ry. rented one bus from this company and operated it during the summer months between Gilbert and Biwabik. Biwabik was the site of the second iron ore discovery by the Merritt brothers in August 1891. The bus operation was shortly discontinued as it proved unprofitable.

The Mesaba Railway Co. was incorporated in Massachusetts 6-29-1914 and purchased the assets of the Minnesota corporation of the same name 7-21-1914.

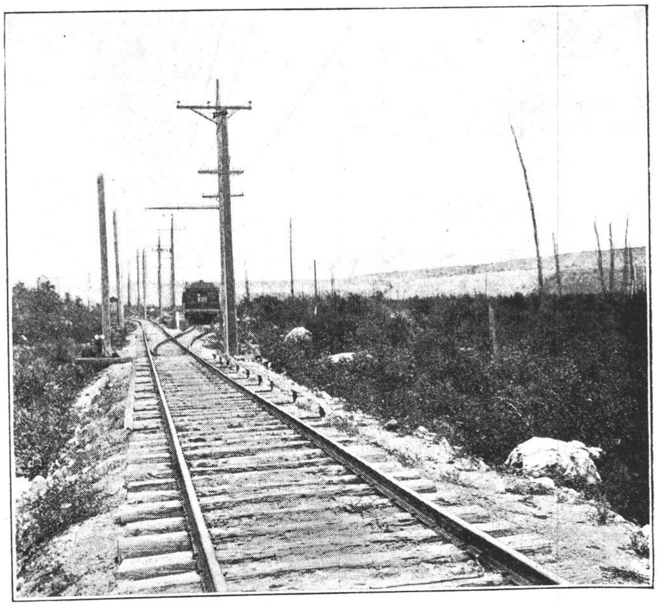
The Hull-Rust Mine of the Oliver Iron Mining Co. had grown steadily and soon surrounded Hibbing on three sides. Discovery that the rich ore deposits continued underneath the city led to the decision to physically move a substantial number of the buildings to a new site further to the south, then known as Alice. The relocation was started during 1919 and was well along by 1921. The remaining portion of the original location was called North Hibbing, while the new site was re-named South Hibbing, although the entire area was within the city limits of Hibbing. This relocation affected the Mesaba Ry. in that a major portion of its line between Hibbing and Chisholm interfered with the expanded mining operation. Provisions in the right-of-way easements with the mining companies included a ninety-day notice of cancellation of right-of-way privileges when such mining interference occurred. It thus became necessary to build a new line between Hibbing and Chisholm if the company was to remain in business. (By 1920 the population of Hibbing and Virginia had increased to 15,089 and 14,022 respectively.) Because of labor and material shortages caused by war conditions, Oliver Iron Mining Co. agreed to furnish the labor and material to construct the new line, for which Mesaba Ry. agreed to issue mortgage bonds to Oliver Iron Mining Co. to cover the amount expended. The new Hibbing-Chisholm trackage was opened for service on December 11,1921.

The Minnesota Highway Department in 1920 started a program of concrete highway construction and within a few years all-weather roads were in use between all of the communities served by the Mesaba Ry. For example, Highway 35 between Hibbing and Virginia was paved during 1923. With the increased use of automobiles and unregulated motor bus competition it became increasingly difficult to cover operating expenses, taxes and interest on the mortgage bonds. The company began operating at a loss during 1922.

On 3-7-1924 the Mesaba Ry. was placed in receivership with Oscar Mitchell of Duluth and James C. Chestnut of MacAlester, Oklahoma, appointed Co-Receivers. During 1925 one-man operation of the cars was begun. The Mesaba Railway Coach Co. was organized and invested $150,000 secured through the assistance of the bondholders' protective committee in a fleet of high-speed buses which were operated between International Falls and Duluth, Hibbing and Aurora.

In early 1927 the company offered to sell the electric railway. When no response was received, the company approached Hibbing and Chisholm businessmen with the proposition that they pool their resources and purchase and operate that portion of the railway between Hibbing and Chisholm. This proposal was turned down. Persons involved with the company claimed that had the public been more friendly and the elected officials of the Iron Range communities more considerate, the eastern financial interests would have put up funds to continue the venture by purchasing equipment and facilities more capable of meeting the competitive situation. Instead the decision was made to cease all operations. Application to discontinue operations was approved by the Federal Court 4-1-1927. Accordingly the last interurban cars made their final runs 4-16-1927.

Mesaba Railway—General View Showing Character of Country and Construction



Mesaba Railway—View Showing Siding and Contact Rails for Signal System

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Directors

C. A. Duncan	Duluth	1913-1920
P. L. Saltonstall	Boston	1913-1920
Robert W. Matson	New York	1913-1920
Oscar Mitchell	Duluth	1913-1927
A. C. Gillette	Duluth	1913-1914
E. E. Hewitt	Duluth	1913-1914
B. R. Henry	Duluth	1913-1914
W. P. Chinn	Gilbert	1915-1927
A. B. Coates	Virginia	1915-1921
Howard S. Graham	Philadelphia	1915-1921
Jay Cooke	Philadelphia	1921-1927
Clement R. Ford	New York	1921-1927
A. McC. Washburn	Duluth	1921-1927

Officers

President	Oscar Mitchell		1913-1927
Vice President	Robert W. Matson		1913-1920
	Clement R. Ford		1921-1927
Treasurer	P. L. Saltonstall		1913-1920
	Lester Flint	(Boston)	1921-1922
	A. Cunningham	(Boston)	1923-1927
Secretary	B. R. Henry		1913-1915
	A. S. Whiting	(Duluth)	1916-1917
	Janet Macauley	(Duluth)	1918-1920
	Agnes Carmody	(Duluth)	1921-1927
Auditor	O. A. Erickson	(Virginia)	1913
	Jay O. Bergerson	(Virginia)	1914-1927
General Manager	H. S. Newton		1913-1914
	R. W. Reynolds		1915-1917
General Superintendent	L. W. Hayes		1918-1927
General Counsel	Oscar Mitchell		1913-1927
Co-Receiver	Oscar Mitchell		1924-1927
	James C. Chestnut		1924-1927

MESABA RAILWAY CO.

ADDENDA

GENERAL HISTORY

1. Mesaba Railway incorporated 11-15-1910 in Minnesota.

2. Mesaba Electric Railway incorporated 1-??-1911; authorized to do business in Minnesota as a holding company and acquired all the capital stock of the Mesaba Railway 3-1-1913. Capital stock $1,100,000 plus mortgage bonds $1,100,000 = cost of road purchased $2,200,000.

3. Mesaba Railway Co. incorporated 6-29-1914 in Massachusetts and purchased the assets of the Minnesota corporation 7-21-1914.

Tucker, Anthony & Company, Boston, held the chief financial interest.

POWER GENERATION AND DISTRIBUTION

Powerhouse

Station excitation: one 35 KW, 125-volt non-condensing turbine exciter. In conjunction with this self-contained unit a motor-driven exciter designed to run in parallel was installed for regular service: one 75 h.p., 600-volt, 3-phase, induction motor direct-connected to a 60 KW, 125-volt, compound-wound exciter.

Substation in the Powerhouse

The motor-generator sets were 300 KW, 750-volts.

OPERATIONS

Fares

Virginia to Eveleth	10¢	
Virginia to Gilbert	20¢	
Virginia to Parkville	5¢	
Virginia to Mt. Iron	10¢	
Virginia to Hibbing	50¢	As of 1925 this fare was 55¢

Simmens Signal System

See separate write-up.

EQUIPMENT

In later years one of the Express Motors, [redacted] #102, was fitted with a roof platform for use as a Line Car.

ERJ
11-20-1926

New Feeder Service by Mesaba Railway

Bus service between Virginia Center and environs has been started by the Mesaba Railway Coach Company, Virginia, Minn., a subsidiary of the Mesaba Railway. James C. Chestnut, receiver, said the service, which would continue regularly until April 30, was instituted for the convenience of the public during the winter months. Buses will operate at regular intervals in accordance with time cards printed and distributed throughout the territory served.

Fare to the north and south side from Virginia Center will be 7 cents and between Virginia Center and West Virginia 10 cents, and also between the north side and south side. A 15-cent fare will be charged between West Virginia and the north side. Coupons, honored on this service, will tend to reduce fares about 10 per cent.

ERJ 12-24-1927

Last of Mesaba Railway Soon to Be Sold

With practically all of the company property and equipment sold, receivers for the defunct Mesaba Railway, Virginia, Minn., serving Mesaba Range communities, expects an early discharge of the receivership.

When the remaining property and the other equipment are disposed of, it is estimated that the gross salvage return on a total cash investment of about $2,000,000 will amount to about $200,000. From this sum receivership expenses and other debts must be met.

Considerable office equipment, several car bodies, the former residence of the superintendent of the line, and twenty-six lots in the Great Northern addition to Virginia, remain to be disposed of, as well as a substation and waiting room at Chisholm.

In all, nine car bodies have been purchased by buyers, for a varied number of uses.

The company passed into the hands of the receivers, James C. Chestnut, Virginia, and Oscar Mitchell, Duluth, on March 7, 1924. Authority to abondon the line was granted by Judge Cant late last winter. The last passenger car was operated over the line from Hibbing to Gilbert on April 16 of this year, but freight car service was continued until June.

The interurban line was placed in service on Christmas day, 1912. The system comprised 40 miles of line.

MESABA RAILWAY COACH COMPANY

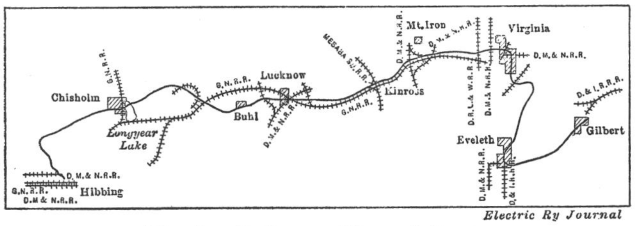
The bus line eventually paralleled the route of the interurban line between Gilbert and Hibbing and was extended to Biwabik and Aurora.

Northland Transportation Company had a route between Duluth, Virginia and Ely. Early in 1927 Northland purchased the Mesaba Ry. Coach Co. and on April 17,1927, replaced the newly abandoned interurban line between Hibbing and Gilbert. Buses on the line running east-west through Virginia would make connections with buses on the north-south line out of Duluth.

New Interurban Railway in the Minnesota Iron Range

A Description of the Mesaba Railway, a 35-Mile, 725-Volt Line with Interesting Construction and Operating Features and a Complete Cab-Signal System

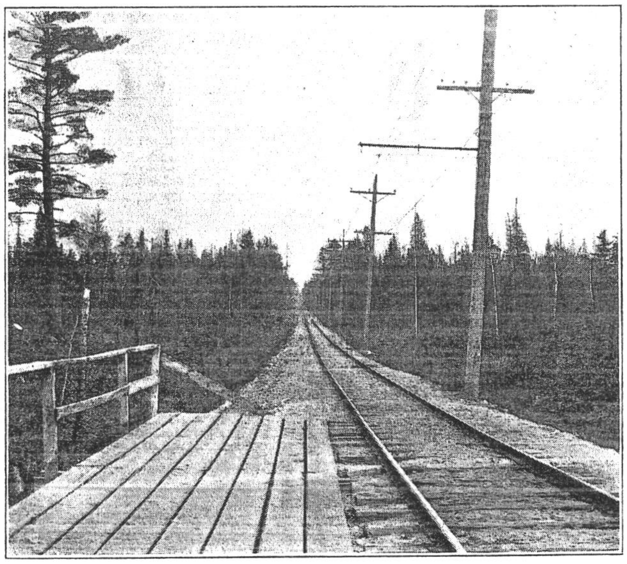
The new Mesaba Railway in the Minnesota Iron Range district is a good example of an interurban electric line recently built in a growing community. The population served by this 35-mile line exceeds 55,000 and is distributed among nine cities and "locations," as the mining settlements are called, varying in size from 500 to 15,000 people. This population is largely made up of the laborers in the open-pit iron mines along the Iron Range, which extends in an east and west direction across that part of Minnesota lying 80 miles north of Duluth and Lake Superior. Although this great iron ore district is served by a network of steam railroads, none of them is interested in a passenger business. All their energies are being directed toward increasing the ore tonnage, which is a most profitable source of revenue.



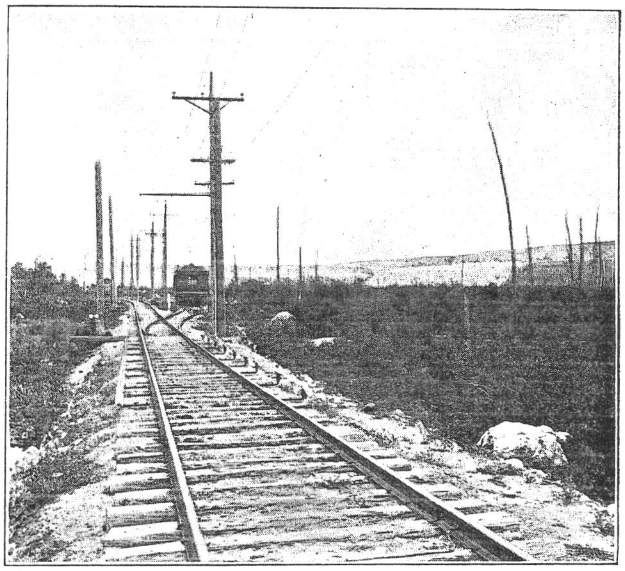
Electric Ry Journal

Mesaba Railway—Map of Route

In considering the possibilities of an electric railway through this district the promoters of the Mesaba Railway found that at least one of the steam roads, the Duluth, Missabe & Northern Railroad, furnished passenger train service between most of the important towns, but that transfers were necessary at junction points on an indirect route, and long delays between trains were frequent. The principal industry of the district was iron mining and lumbering, and there was a natural channel of intercommunication between the "locations" and the cities. This fact was quite evident from the amount of passenger traffic between these centers, even under the inconvenient service offered by the steam roads before the advent of the electric line.



Mesaba Railway—General View Showing Character of Country and Construction



Mesaba Railway—View Showing Siding and Contact Rails for Signal System

Another inducement to the promotion of an electric line in this locality was the possibility of a lighting and power business, inasmuch as the service rendered to most of the larger communities was by isolated, inefficient generating plants. Already three of the larger cities have made contracts with the railway company, and others are negotiating for a similar service. Then, too, the present terminals of the electric line are well within the iron-mining district. A territory almost as rich in iron ore deposits as that now served and one which abounds in "locations" and growing towns lies both to the west and east. The intention is to extend the line in the near future to serve these communities, and ultimately a lighting and power business will be developed in the entire territory.

Some unusual difficulties were encountered in the construction of this line, although the natural topography is that of a slightly rolling country which, under ordinary conditions, would require the average amount of grading to produce a normal interurban line. These difficulties took the form of great mounds of earth stripping removed from the surface of the open-pit iron mines. To project the line through these would have increased the cost of grading to a point where it would have been prohibitive. Hence, it was decided to build the line around them with easy curves and at the same time obtain a reasonable grade line. Other characteristics of this country which tended to increase the cost of construction included sink-holes or bogs in which it was practically impossible to obtain a permanent bearing, and at other points the line was constructed through fields of large boulders.

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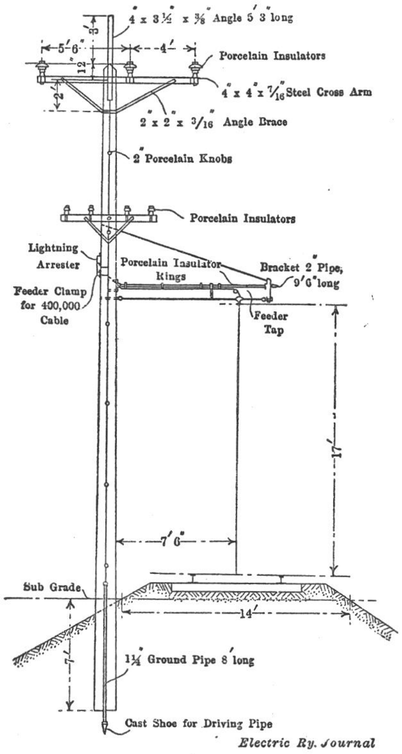
TRACK AND ROADWAY

The line was built on a private right-of-way, 50 ft. in width, through the rural districts and in the streets through the cities and villages. As the rural population was very small with little or no farming, it was unnecessary to fence the right-of-way. Fortunately, too, there were but few streams requiring bridges. In fact, the only waterways of any consequence were a few shallow lakes. To offset the advantage of a scarcity of waterways, however, numerous railroad crossings were necessary. Some were obviated from an operating standpoint by grade separations, and others were crossed at grade. Grade crossings were introduced only where a grade separation was not feasible or was unwarranted because the track was one on which only a few trains were operated each day. The most important of these grade separations was at Kinross, where combination wooden-trestle approaches to a steel girder cross the intersection of two steam roads. A view of this crossing is shown in one of the illustrations.


4" x 3½" x ⅜" Angle 5' 3" long
3'
5' 6"
4'
12"
Porcelain Insulators
2'
4" x 4" x 7/16" Steel Cross Arm
2" x 2" x 3/16" Angle Brace
2" Porcelain Knobs
Porcelain Insulators
Lightning Arrester
Porcelain Insulator Rings
Bracket 2" Pipe, 9' 6" long
Feeder Clamp for 400,000 Cable
Feeder Tap
17'
7' 6"
Sub Grade
14'
7'
1¼" Ground Pipe 8' long
Cast Shoe for Driving Pipe
Electric Ry. Journal

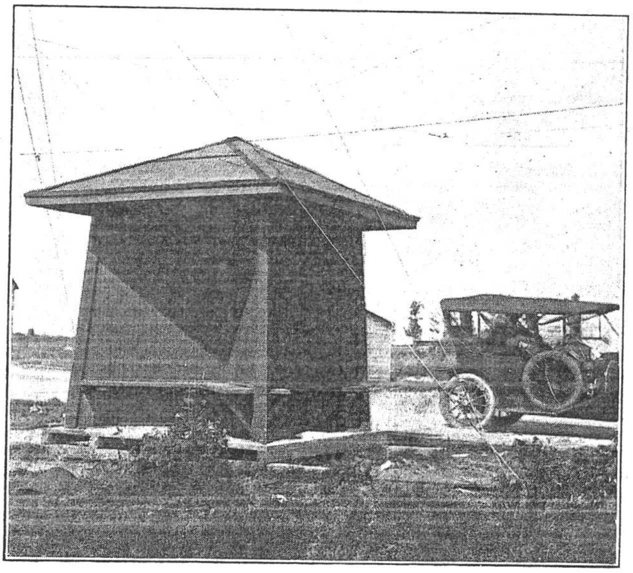
Mesaba Railway—Typical Roadway Section

The standard roadway construction employed includes a 14-ft. roadbed on embankments with 3-ft. ditches on each side of the roadbed in excavation. The track is laid on 6 in. of gravel ballast taken from a pit on the company's right-of-way and consists of 6-in. x 8-in. x 8-ft. tamarack ties, 70-lb. A. S. C. E. rail, 24-in. angle bars and 26-in. Ohio Brass Company's compressed terminal bonds. The latter are quite unusual as they are of the concealed type, but as they are longer than the joint, the terminals are exposed. This arrangement permits of easy inspection to determine when the bonds become defective.

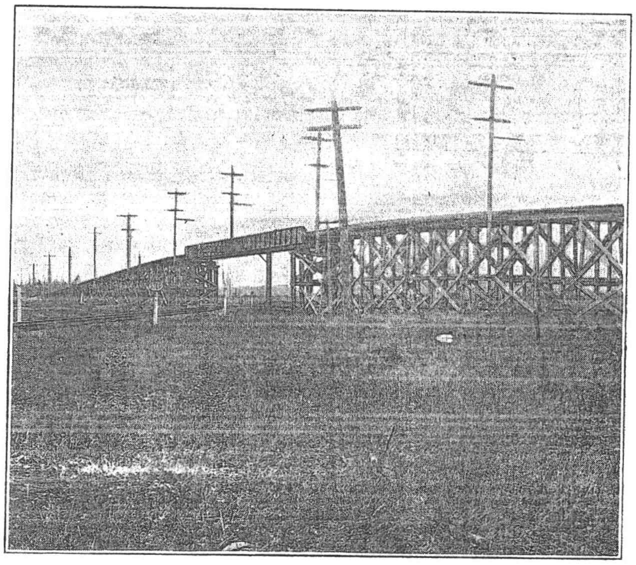
OVERHEAD CONSTRUCTION

Except for one or two unusual features, the overhead lines conform to general practice. The trolley is supported on pipe mast-arms, 17 ft. above the top of the rail, and in turn the mast-arm is attached to a 40-ft. Idaho cedar pole which also carries the telephone, signal and transmission line wires.

One novel feature in the overhead line construction is the cross-arm used to support the transmission lines. This arm is a 4-in. x 4-in. x 7/16-in. structural-steel angle, set 2 ft. off center, in order to give a 4-ft. clearance between the two transmission lines on one side of the pole and a 5-ft. 6-in. interval between the middle line and the third line on the opposite side of the pole. Another structural angle, 4 in. x 3½ in. x ⅜ in. in section and 5 ft. 3 in. in length, is bolted to the side of the pole opposite the transmission line cross-arm and serves to support the ground wire. A direct ground is obtained by a connection both to the transmission line cross-arm and the structural angle supporting the ground wire above the top of the pole. This ground wire is carried down the side of the pole on 2-in. porcelain knobs and connected to ground by 1¼-in. pipe 8 ft. long. The base of this pipe is provided with a cast-iron shoe for driving, and the top has a special grounding cap. In appearance this cap resembles an ordinary hexagon nut, except that it is tapped out only on one side to fit over the head of the 1¼-in. ground pipe. A horizontal slot is cut in the cap 7/16 in. below the top, and a tapered hole slightly off center is drilled from the top of the cap through this slot. The depth of the slot and the location of the tapered hole are such as to leave sufficient space between the inside edge of the slot and the hole to wedge securely the grounding wire when a pin is driven into the tapered opening.



Mesaba Railway—Typical Way Shelter



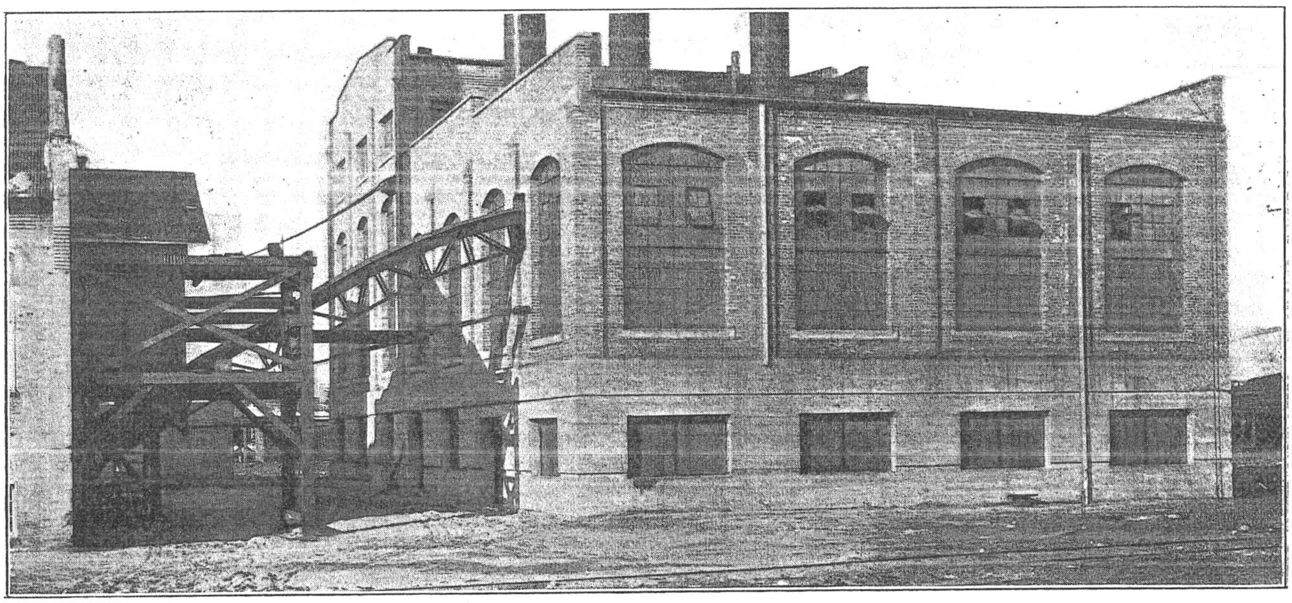
Mesaba Railway—Combination Wooden Trestle Approaches to Steel Girder Bridge at Kinross

POWER STATION

The power station of the Mesaba Railway Company is situated on the property of the Virginia & Rainy Lake Lumber Company, approximately one-quarter mile from the main track where it enters the city of

Virginia. At this location it was possible to obtain refuse from the lumber mill for fuel, and water is taken from a lake situated but a short distance from the power-house site. This location was selected also because it was desirable for a substation.

Owing to the high cost of coal in this locality, the large quantity of wood fuel available from the lumber mill was practically a governing factor in the selection of this power-house site. Prior to the construction of the power house, however, it was ascertained that there was a large surplus of fuel over that required to operate the lumber company's generating plant. The character of this fuel, which consists of wet or green sawdust and small pieces of pine wood, may be seen in the illustration showing the fuel deck. An overhead conveyor from the mill of the Virginia & Rainy Lake Lumber Company delivers this fuel into the firing room of the electric railway power station. The sixteen openings in the bottom of the conveyor trough, uniformly spaced across the boiler room, are opened and closed by hand levers. Twelve of them supply chutes which deposit the fuel directly into the fire box, and four open into short spouts which deposit it on the fuel deck. The quantity deposited on the fuel deck during the six days of the week when the lumber mill is in operation is sufficient to last during the period when the mill shuts down from Saturday night to Monday morning. During this time it is necessary to charge the fireboxes by hand.



Mesaba Railway—Generating Station at Virginia, Minn.

The power house proper is in a building 60 ft. x 120 ft. in plan. It is built on concrete foundation supported by piling, and the superstructure is of steel, brick and concrete. The power house building is divided into two sections, namely, the boiler room and the generator room, and each is built with a basement. The boiler equipment embraces three 300-hp Edge-Moor horizontal water-tube boilers with four fuel chutes and firing doors to each. These boilers were designed for 175-lb. pressure at 75 deg. superheat and were guaranteed to develop 450 hp each, with a 1-in. draft at the breeching outlet. They are served by three 150-ft. guyed steel stacks 4 ft. 6 in. in diameter. The boiler feed water is heated to approximately 204 deg. in Hoppes heaters, which are served by a turbine-driven boiler-feed pump. The feed-water heater is supplied with exhaust steam from the boiler-feed pump, the general service pump and the turbine-driven exciter.

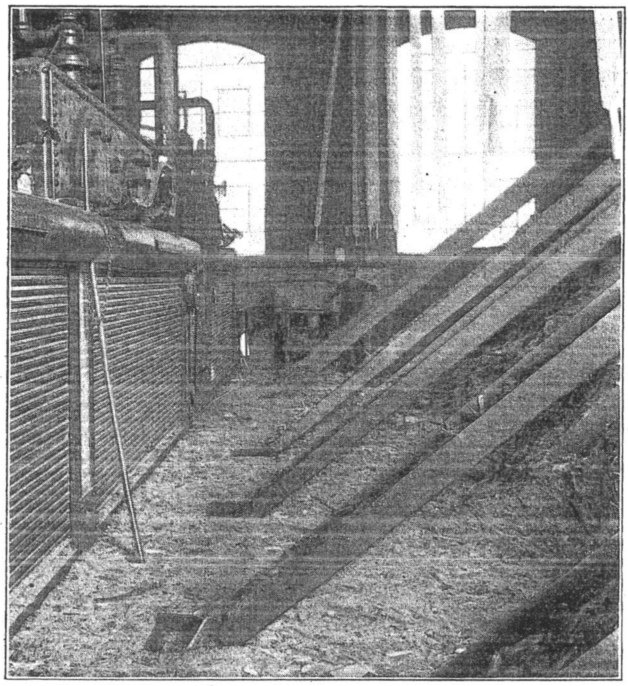
Wood fuel made it necessary to equip the fireboxes with unusually large grate areas, and each contains approximately 90 sq. ft. No attempt is made to spread the fuel over the grate after it has passed through the firing doors from the fuel deck. It forms a cone-shaped pile on the grate under each firing door and burns around the edge of the pile. As it is necessary for the fireman to attend to the fuel chutes on a floor directly over the fireboxes, the essential insulation against heat was obtained by supporting the floor on a Dutch oven extension with thick arches.

It was originally intended that the line voltage of the Mesaba Railway would be 1200 volts, but before actual construction had begun it was decided that the motor generators should be designed for 750 volts d.c. and operate at 600 volts. Shortly after operation started it was found the traffic was much heavier than anticipated and that the copper was barely sufficient during the peaks. Accordingly, it was decided to take advantage of the higher pressure for which the generators were designed and raise the voltage to 750. This could be done without any other serious difficulty, as the railway motors, although designed for 600-volt operation, were of the interpole type which permitted an increase in pressure to 750 volts without danger to economy of operation. Sixty cycles have been used for the transmission frequency, partly because of the lighting and power business and partly because that is the frequency used in the Virginia & Rainy Lake Lumber Company's power plant. A three-phase line has been installed between the two switchboards so each station may synchronize with the other in case an interruption does occur, and as an extra precaution, the main steam headers of the two stations are also connected.

The generating equipment includes two 750-kw, 600-volt, three-phase, 60-cycle horizontal condensing turbines operating at 80 per cent power factor and 3600 r.p.m. At the present time one of these units is held as a spare, but the rapid increase in the load anticipated in the near future, owing to new contracts for light and power service, will soon require the spare unit to be placed in regular service. The governors on the turbo-generators are controlled by a motor from the switchboard and each generator panel is also equipped with a wattless component indicator. Station excitation is obtained from a 35-kw, 125-volt, 3600-r.p.m. non-condensing turbine exciter. In conjunction with this self-contained unit, a motor-driven exciter designed to run in parallel has been installed for regular service, the turbine exciter being used only in case the plant is shut down. The motor-driven exciter set consists of a 75-hp, 1200-r.p.m., 600-volt, three-phase induction motor direct-connected to a 60-kw, 125-volt compound-wound exciter.

In the portion of the turbine room used as a substation two 300-kw, 750-volt synchronous motor-generator sets have been installed. These are General Electric two-bearing machines with compound-wound generators which feed the line at 750 volts d.c. One of these units serves as a spare at the present time. The motor-generator sets are served by three 250-kva water-cooled transformers.

A switchboard gallery is located in one corner of the turbine room and the space under it is utilized for the transformer equipment. All circuits to the switchboard are arranged so that no switches are on the high-tension side of the transformers. This arrangement as well as the location of the switchboard gallery over the transformers reduced the copper to a minimum and at the same time provided ample room for operation. The switchboard contains fifteen panels and a swing bracket at each end. All wiring between the switchboard and the generator and substation units is housed in metal conduit embedded in the concrete building floors, and the board is thoroughly grounded.

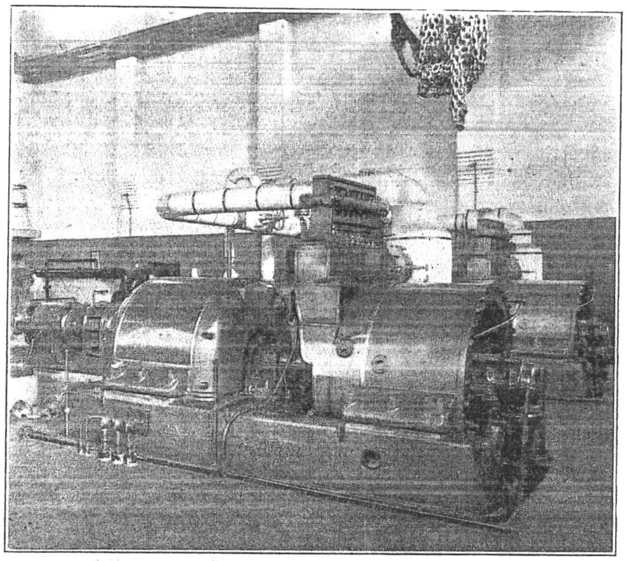


Mesaba Railway—Fuel Deck Over Boiler Room Floor

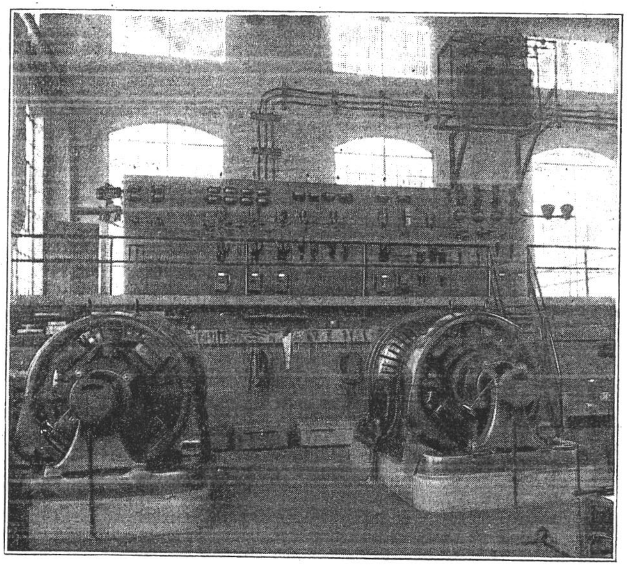
SUBSTATIONS

At present the substation in the power house and the substation at Chisholm, 20 miles west, are all that are required to operate the line. A transmission line, consisting of three No. 2 copper wires, connects the power station with the Chisholm substation, and current is transmitted at 22,000 volts. Two 400,000-circ. mil d.c. feeders feed both ways from the power house. One connects it with the Chisholm substation and the other extends east to Gilbert. A 300,000-circ. mil feeder is installed between Chisholm and Hibbing, the west terminus of the line.

The substation at Chisholm is operated in conjunction with the passenger and freight station, a single agent serving both. The substation proper is housed in a one-story building constructed of brick and steel. The three-phase transmission line enters this structure by way of a structural-steel bracket and 15-in. tile openings through the building wall. It is supported on the building wall inside the station by insulated pipe brackets, and after passing through choke coils and disconnecting switches this 22,000-volt line is connected to the 200-kva, 22,000-to-600-volt self-cooled transformers by way of oil switches. The transformer set is installed immediately back of the switchboard that occupies the transverse center of the substation building, which is 24 ft. by 44 ft. in plan. The floor space opposite the transformer section is occupied by two 300-kw motor-generator sets, which convert the sixty-cycle a.c. into d.c. at 750 volts. Both interior and exterior views of this substation are shown in the illustrations.



Mesaba Railway—750-kw Turbo-Generators



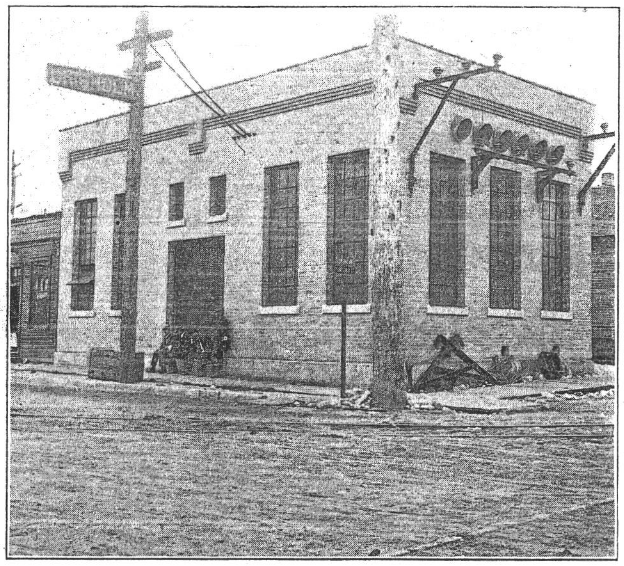
Mesaba Railway—View of Motor-Generator Sets and Switchboard Gallery

SIGNAL SYSTEM

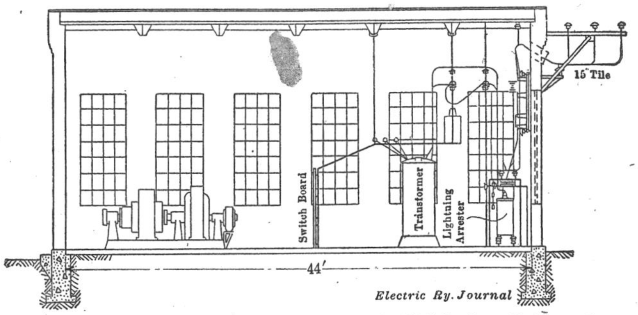
A complete installation of the Simmen system of railway signaling has been installed on this line. The dispatcher set includes a nine-lever board, interlocked and equipped with time and location recording mechanism and record sheets such as have been described in the

ELECTRIC RAILWAY JOURNAL. Six telephone dispatcher lines are also connected into the board, and each line is equipped with a bell of a different tone instead of the usual drop.

The third-rail installations on this 35-mile line provide for a block approximately 6 miles in length, with home and distant rails protecting each siding. The third-rail locations were also selected with a view to eliminating difficulties which might arise through drifting snow. The method of installing the third-rails conforms to the standards employed on the Indianapolis & Cincinnati Traction line, as well as the Nashville-Gallatin Interurban line. Certain refinements in the operation of this signal system, however, have been included.

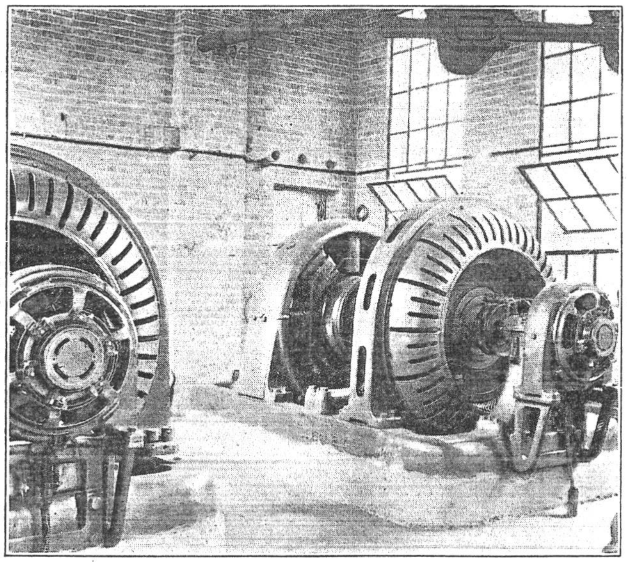


Mesaba Railway—Exterior of Chisholm Substation

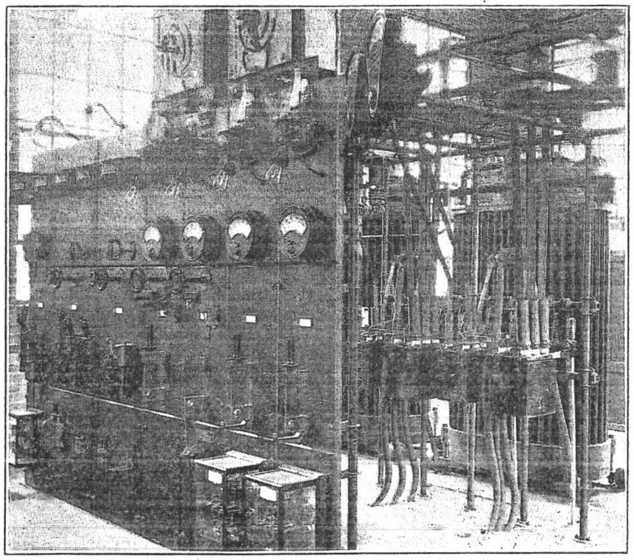


Mesaba Railway—Cross-Section of Chisholm Substation

Probably the most important of these additions to the system is the directional movement protection, which is essentially as follows: When a west-bound train is about to take possession of the block the circuits are arranged so that an east-bound train receives a red light if it attempts to oppose the west-bound train in the same block. Each block may be set for either an east or west-bound movement, but the moment it is set for one the other is disengaged. This might be accomplished in the usual way—that is, by two separately controlled circuits—but the Simmen system accomplishes the east-bound and west-bound control over a single wire. The principal features of this arrangement include three phases of control. One gives a green light to an east-bound movement by energizing a third-rail positive, another gives a west-bound movement a clear light by energizing the third-rail negative, and a stop indication is given to each by totally de-energizing the rail.



Mesaba Railway—Motor-Generator Sets in Chisholm Substation



Mesaba Railway—Switchboard and Transformer Section of Chisholm Substation

In further explanation of this feature, suppose that all east-bound movements require a positive current to produce a green light, then all east-bound trains with a green light must be governed by a positively energized rail. In this example the east-bound movement is protected by making all west-bound movements clear with a negative current. Hence, if a west-bound train passes a positively energized rail, it receives a red indication.

The operating advantages of this arrangement are that the east-bound train may take a siding, and in case there are two or more sections of the west-bound train, the east-bound train must be in the clear before the west-bound train can receive a proceed signal. If all rails are negatively energized—that is, if they are providing a clearance signal for west-bound trains—the east-bound car is held at that siding until all the sections of the west-bound train have passed, and it cannot leave until the dispatcher changes the levers and positively energizes the rail.

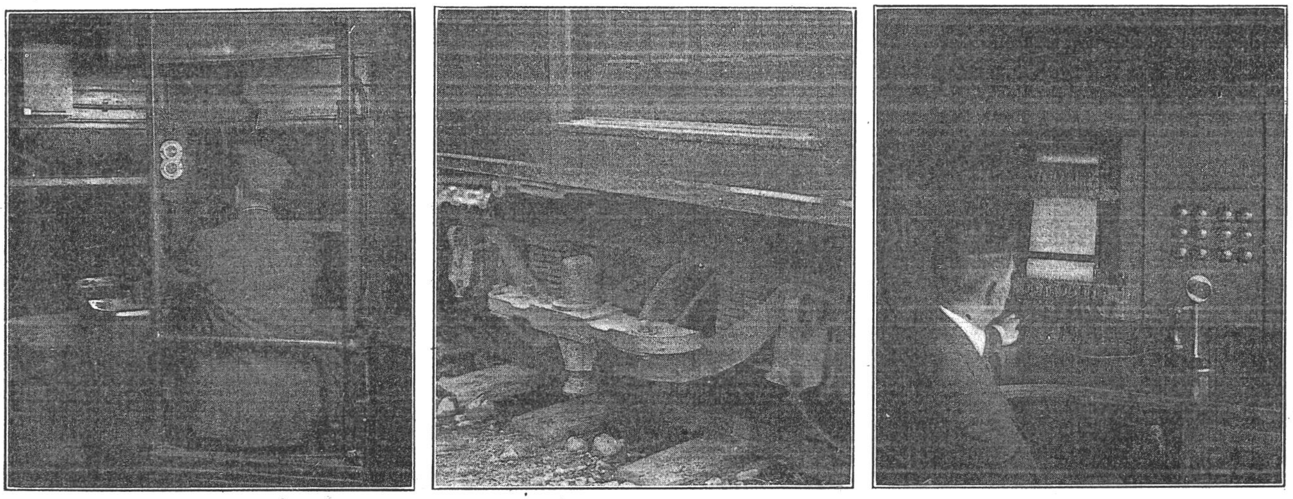
The added cost of this construction over the simple form of control, such as is used on the Toronto & York

Radial Railway, is practically negligible. The principal addition necessary in the installation is the additional batteries in the dispatcher's office. These two batteries are arranged with one positive to ground and the other negative to ground. To obtain the advantage of the directional indications, it is also necessary to change the ordinary relay on the car to a polarized relay and install a directional switch.

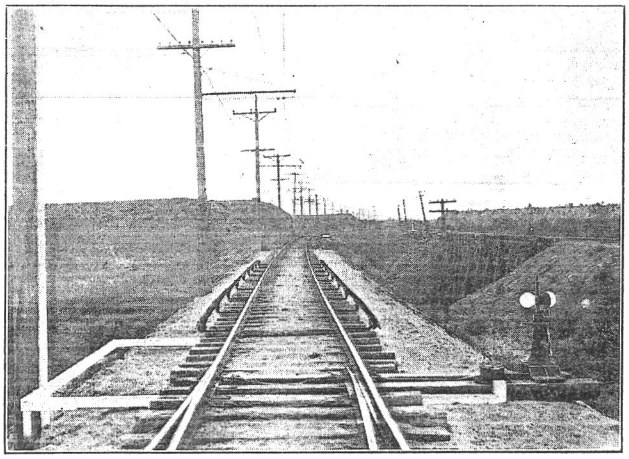
In actual practice it has been found that the propulsion current, which is positive to trolley and negative to track, tends to go through the signal circuits. Accordingly, it has been necessary to increase the battery positive to the signal line so as to overcome this shunted propulsion current. It has also been found that the amount of propulsion current flowing over the signal lines increases with the number of defective bonds. Hence a periodical test of the signal circuits provides a close check on the bonding conditions of a line. When the shunted propulsion current becomes excessive it produces a red cab signal, owing to the fact that the signal current is counteracted by leakage of the propulsion current.

On the Mesaba Railway signal lines a 40-volt signal current was used in one direction, and the propulsion current assists in energizing the signal lines with the proper polarity. In the other direction it was necessary to use 80 volts, as the signal current is decreased by the propulsion current leakage, which is of the opposite polarity. The voltage of the current in arranging this signal system for directional indications depends on the relative location of the power house and the dispatcher's office. No difficulty has been experienced, however, in the operation of the directional indication, and it has now been installed on the lines of the Indianapolis & Cincinnati Traction and of the Nashville-Gallatin Interurban Railway as well as on the Mesaba Railway.

The directional switch provided in the cab of each car in addition to the polarized relay has three positions—one for west-bound movement, one for east-bound movement and a neutral position which entirely disconnects the car batteries. The latter position is used when the car is in the carhouse or is making a long lay-over on a side track. Although the position of the directional switch is under the control of the motorman, it does not depend on the human element. In case the directional switch is not in the proper position, a car cannot receive a green light because the terminal third-rails can be energized only with one polarity, namely, only positive for east-bound and negative for west-bound terminal rails.


Mesaba Railway—Signals in Vestibule of Car—Revolving Contact Shoe—Equipment in Dispatcher's Office

The east-bound and west-bound movement has made possible the use on each car of a single shoe, which makes contact with those third-rails on the right-hand side of the track. The removal of one shoe from the single-end car more than offsets the added cost of the polarized relay. On a double-end car, however, two shoes are required, and also a small four-pole switch. Two poles of this switch connect the shoes, and the other two poles connect either one or the other set of cab signals. If a motorman changes from the front to the rear cab, he cannot get the cab signal permitting him to proceed until this four-pole switch is in the proper position.


Mesaba Railway—View at Center Siding Showing Signal Rails and Switch Box

Open-switch protection is also provided in a simple and inexpensive way. This is done by passing the signal wire through an ordinary switch box before connecting it to the third-rail. In this way, when the switch is open or partly open, the signal current cannot reach the third-rail as the circuits are broken at the switch box.

The passage past a non-energized third-rail produces a red cab signal on the car at the distant rail, which is 2000 ft. away from the home rail on this road. Both trailing and facing open-switch protection are feasible, because, after passing through the switch box, the energy may take a secondary line connecting the home and distant signals on both sides of the point to be protected.

The length of the third-rail as well as the size and quality of the signal wires were adopted only after careful investigation. Heretofore it has been the practice to use a copper-clad wire for signal wire, but the Mesaba Railway employed a No. 10 galvanized-iron wire with glass insulators. This represented a saving in the cost of the signal circuits and the iron wire has been just as satisfactory in the operation of the signal system as the copper-clad wire. The third rails are 70 ft. in length and are made up of two sections riveted together. Recent speed tests have shown that a 25-ft. rail was sufficient in length to give the necessary time element for relay action at a speed of 89 m.p.h. A 70-ft. rail was used merely to provide a factor of safety.

At the Hibbing and Gilbert terminals the track was in paved streets and a third-rail signal installation was not practicable. To meet this condition the signal circuits were extended to the telephone booths at the terminal, where red and green light signals similar to those in the car were installed. These lamps were connected in and operate on the principal signal circuit, which is opened and closed manually. When the motorman or conductor obtains an order from the dispatcher over the telephone he closes the signal circuit and obtains the light indication before starting his run.

ROLLING STOCK

The initial rolling stock equipment for the Mesaba Railway includes five motor passenger cars, five motor combination cars, four trail cars and two express, baggage and freight cars. The general dimensions of the passenger motor cars are as follows: Length over buffers, 47 ft.; length over vestibule, 47 ft. 2 in.; length of car body, 37 ft.; length of main compartment, 25 ft. 7 in.; length of smoking compartment, 11 ft. 5 in.; length of vestibule, 5 ft.; seating capacity, fifty; weight of car body, approximately 26,000 lb. The general dimensions of the express motor cars are as follows: Length over buffers, 46 ft.; length over car body, 43 ft. 4 in.; length inside for freight, 35 ft.; weight of car body, approximately 21,000 lb.; weight complete with trucks, air-brake equipment and motors, approximately 27 tons.

The most important consideration in the design of the passenger equipment was to provide protection against the extremely cold weather common in this locality. In order to accomplish this end the cars have double side walls sheathed outside with 1/8-in. x 34-in. steel plates, and the windows are provided with removable storm sashes. Owing to the fact that a large percentage of the passengers carried are ore workers in soiled clothing, it was deemed advisable to make interior finish in dark oak and to upholster the seats in rattan.

These cars were designed and built by the Niles Car & Manufacturing Company for local interurban service, medium speed and frequent stops. They are of a composite construction with two 6-in. I-beams reinforced under the platforms with 1/2-in. x 5-in. steel plates in the center sill and two 5/8-in. x 7 3/4-in. steel plates in the side sills. The body is thoroughly rodded and trussed and reinforced with steel plates. Each side of the car body at the rear end and the right side at the front end are fitted with 31-in. single-swing doors, triple steps with safety treads and steel trap doors. The car bodies are mounted on Baldwin locomotive trucks, equipped with four GE-201 600-volt interpole motors rated at 50 hp. They are equipped with the GE type-K control and Westinghouse combination automatic and straight air brakes. Other special equipment includes the Peter Smith Heater Company's forced-draft heaters and Ohmer registers. Car illumination is obtained from 145-volt lamps, arranged five in a series and direct-connected to the 750-volt propulsion circuits.

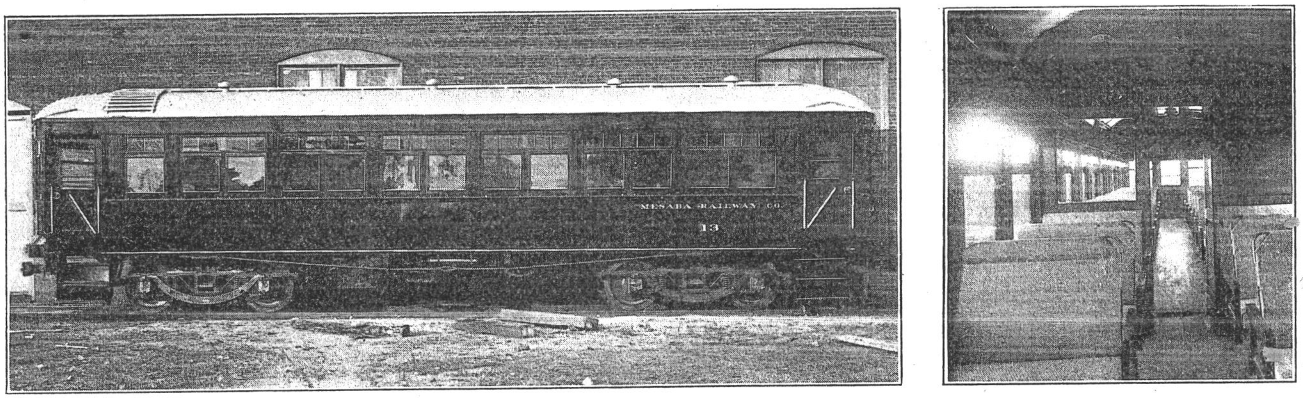
OPERATION

From the beginning of operation an hourly schedule has been maintained over the entire line. In many instances this service has not been adequate, and it was necessary to utilize all the passenger equipment the company had on hand to move the traffic. Most of the extra service takes the form of a two-car train consisting of a motor and trailer. At the present time the largest proportion of passenger traffic is between Virginia and Evelyth. The Mesaba Railway carhouse is especially well located to handle this, as it is just west of Virginia, where a trailer may be added to the car going to Evelyth and may be removed from the car on the return trip. The Egry train order system is used exclusively and all telephone booths and other points at which orders are received from the train dispatcher are equipped with Egry dispatchers.

Owing to the fact that the Mesaba Railway has just begun operation, the freight service has not been thoroughly developed. At present an l.c.l. express business is being handled at rates approximately 30 per cent above standard steam-road freight rates. As the territory served is almost frontier in character, the novelty of it all has not worn off, and the shippers as well as the consumers are just beginning to realize the value of the high quality of express service which the electric line can offer. This business is developing rapidly, however, and undoubtedly will become quite an item in the gross revenue of the company in the near future. As evidence of what may be expected when all classes of traffic have been fully developed, the present gross earnings average 49 cents per car mile.

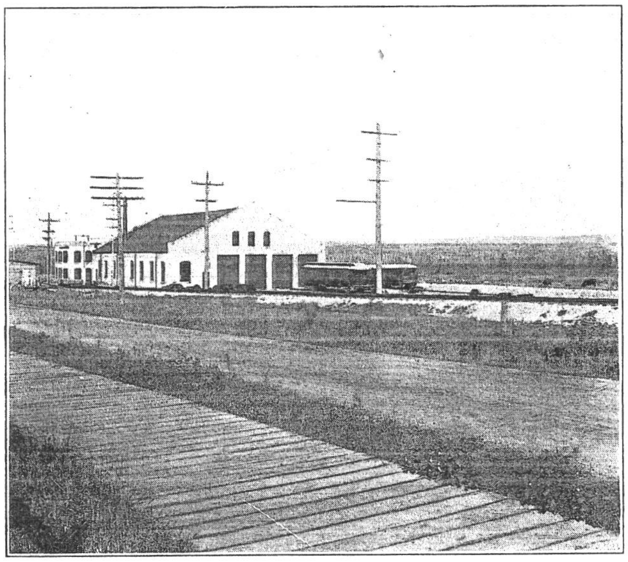
COMBINATION CARHOUSE AND SHOPS

As mentioned earlier in this article, the carhouse and shops are located just west of Virginia, on a strip of property, 200 ft. in width, paralleling the main track between Virginia and Hibbing. The carhouse proper



Mesaba Railway—Side View Passenger Motor Car—Interior View.

was a brick, steel, wood and concrete structure, 86 ft x 122 ft. in plan, but since this article was prepared this carhouse and an adjoining two-story office building were destroyed by fire. As originally built, four tracks ran through the carhouse, and two of them passed over a repair pit, 56 ft. in length, situated at one end of the building opposite the repair shop space. The shop and storeroom occupied a 20-ft. aisle on one side of the carhouse, and the former was inclosed with brick partitions. The eight track entrances, four at each end of the carhouse, were provided with rolling steel doors so that the building could be entirely inclosed. Immediately after the fire the company constructed temporary quarters for the cars and, as soon as weather will permit, intends to replace the temporary structure with a permanent carhouse and shops.



Mesaba Railway—General View of Carhouse and Shops Before Destruction by Fire

The Mesaba Railway was built by the present owners, assisted by the Cleveland Construction Company, of Cleveland, Ohio. The former did all the grading, bridging and track laying, and the latter acted as electrical engineer in charge of all electrical design and construction.

MEETING OF AMERICAN ECONOMIC ASSOCIATION

An account was published last week of the opening sessions of the American Economic Association at Minneapolis.

Prof. Karl F. Theodor Rathgen, of the Colonial Institute of Hamburg, Germany, was the first speaker to discuss the paper by Mr. Brooks on "Syndicalism." He disagreed mildly with Dr. Brooks. Syndicalism, he said, was essentially a growth of the Romance nations, partly because in these nations there had been no great trades union organizations. It had very little hold on German workingmen. It was the socialism of the small workshop, not of the large enterprise. He thought that syndicalism would split up, one portion going into trades unions and another would gradually disintegrate because it underestimated the persistent force of society as organized at the present day.

Several other speakers took part in the discussion. One remarked that if syndicalism could only discipline itself it might bring about a tremendous change in the social structure. Another doubted if anything like true syndicalism had ever been experienced in this country. A third gave a brief account of the situation in New Zealand. Still another speaker expressed the hope that the American Federation of Labor would be able to reach the unorganized mass of laborers in this country, which it has not done hitherto. Mr. Eastman, of St. Paul, declared that the movement was serious and was entitled to respect and sympathy. A professor from Ohio State University who had been in England recently praised the effort making there to give college training to labor leaders with the understanding that they were to stay in their own class and help their fellows and not to grow out of it as a result of their education.

THE TRUST QUESTION

Professor Gray, of the University of Minnesota, presided at the closing session of the afternoon of Dec. 30. The principal paper was by Prof. Willard E. Hotchkiss, Chicago, Northwestern University, on "Recent Trust Decisions and Business." In regard to the enforcement of the Sherman law the speaker said it might be a question whether the Attorney-General, with due regard to his oath of office, could in the future safely omit to take cognizance of specific acts of *prima facie* violation when the court had already established the illegality of similar practices. In the main the enforcement of the Sherman law has had, and still has, a patriotic and beneficial purpose. However, the serious need of a definition for "fair competition" was clear. The speaker devoted considerable attention to the efficiency of trusts and concluded that the alleged superior efficiency of combinations had not yet been established.

DISCUSSION

Prof. E. Dana Durand, of the University of Minnesota, advocated an amendment to the Sherman law defining the limitations of fair competition. Railroads were recognized as monopolies, but to regulate monopoly of the manufacturing industry was a far different proposition. Another question to be asked was, If the trusts were dissolved could competition be restored? Professor Durand thought that it could be in the long run. The bringing of a suit for the dissolution of a trust or for violation of the Sherman law should not rest in the discretion of a single individual. There should be a permanent government industrial commission to advise the Attorney-General and the Supreme Court in the matter.

Prof. W. A. Rawles, Indiana University, favored an exhaustive investigation by an interstate industrial commission, the amendment of the patent laws and federal control over industrial capitalization and accounting.

Others who discussed the question were Dr. F. L. McVey, University of North Dakota; Prof. J. E. Le Rossignol, University of Nebraska; Prof. G. E. Putnam, University of Kansas; Prof. M. S. Hildman, Stanford University, and Dr. W. W. Folwell, University of Minnesota.

NEW OFFICERS

At the business sessions of the association Dr. John H. Gray, professor of economics in the University of Minnesota, was elected president of the association, and Prof. A. A. Young, of Cornell University, was elected secretary and treasurer. The next annual meeting will probably be held in Princeton, N. J.

The London County Council has been considering the opportunities for co-ordinating, as far as possible, the various electric systems in London and expanding them on economical lines. The committee that has this matter in hand was granted $14,550 for obtaining expert opinion, and though the experts' report is not expected for some time, it is rumored that the proposals are likely to be of a drastic character.

Mesaba Railway's New Repair Shops and Office Building

These New Buildings Replace Those Which Were Destroyed by Fire in November, 1913, and Contain a Number of Interesting Features—Details of Construction and Description of the Various Shops Are Given

BY GOTHARD SARGL, SUPERINTENDENT OF CONSTRUCTION CLEVELAND (OHIO) CONSTRUCTION COMPANY

After a year in temporary quarters following the disastrous fire which destroyed the shops and office building, the Mesaba Railway office and repair force is now housed in new quarters. Situated on the frontier of Minnesota, 80 miles north of Duluth, the nearest city of any size, the Mesaba Railway, a 35-mile interurban road, connects a number of villages and mine locations in the Mesaba Iron Range. The construction features of this road were described in the Jan. 10, 1914, issue of the ELECTRIC RAILWAY JOURNAL on page 68.

REPAIR SHOP CONSTRUCTION DETAILS

Essentially the new layout conformed to the original plan in that the foundations of the original repair shop were used and a separate office and dispatcher's building constructed. In addition, a paint shop, also in a separate building and more than 60 ft. away from the repair shop, was also provided.

The new repair shop is a brick, steel and concrete structure, 86 ft. x 122 ft. in plan. This area is divided into a car-storage bay and repair and machine-shop bay a portion of which is given over for a storeroom and a heating plant. A 13-in. fire wall extending 3 ft. above the roof separates the car-storage bay from the repair-shop bay. Trackage in each of these sections provides for the storage of four cars, and all of the car-storage space in the repair-shop bay is constructed over repair pits.

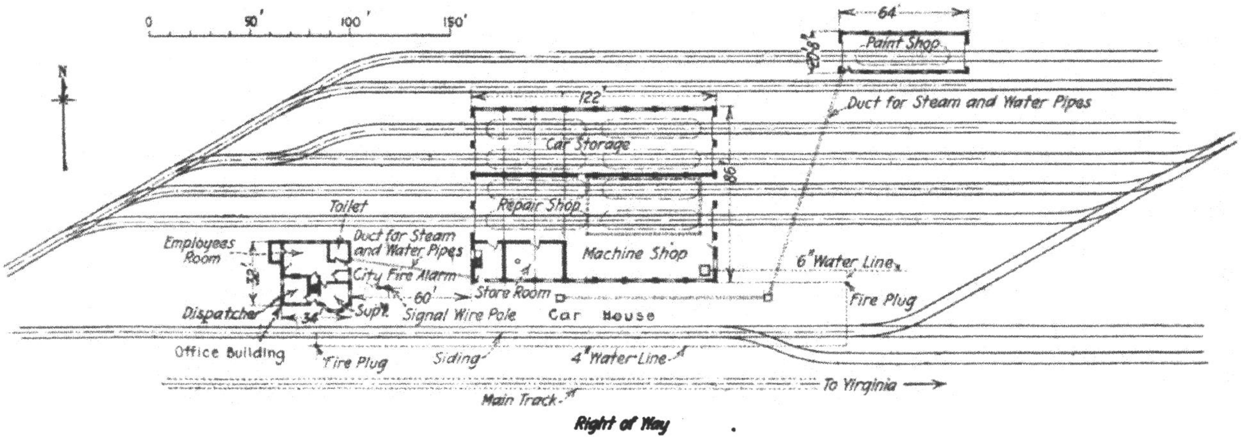
Following the fire the original pits were restored with timber which was permitted to remain in the new structure. These pits were extended, however, so that storage space was provided for four cars. The pits in this extension are of concrete construction, and it is contemplated that later the old wooden pits will be replaced with others built of concrete. Experience during the first winter in this extremely cold climate demonstrated that additional pit area was necessary to thaw out the cars. To minimize the time required to thaw out the frozen car equipment, however, radiation considerably in excess of that ordinarily required was installed on the pit walls.

Steel trusses supported on the brick walls span each bay, and in the intervals between these are concrete roof slabs reinforced with Ferroinclave and carried on steel purlins. These slabs are 1⅜ in. thick, formed of 1 in. of concrete on the upper side of the reinforcement, 3 in. on the under side and covered with a five-ply tar and gravel roofing. Eight flat wire-glass skylight openings were provided in the roof along the fire wall to provide a uniform natural illumination in all parts of the building. A liberal spacing of windows in the side and end walls of the repair shop section insures ample natural illumination in all parts of the machine shop. The four car door openings at each end of the building are 12 ft. wide by 16 ft. 6 in. high and are equipped with Kinnear rolling steel doors. The openings in the fire wall between the two bays and those leading to the storeroom and boiler room are fitted with standard Underwriter's fire doors.

Three 2-in. hose connections with hose and racks were installed in the repair shop building, and two standard fire hydrants were provided in the storage yard adjoining the building. In addition to these a Gamewell fire-alarm box connected to the Virginia city fire alarm system was installed near the office building so that the city fire department may be called. Water is supplied to the fire-protection system through a 6-in. water main which connects to the city water system.

ARRANGEMENTS OF SHOPS AND EQUIPMENT

Conveniently located in the repair-shop bay beside the repair pits in a space 25 ft. wide by 75 ft. long is the machine shop. This contains the usual machine tool equipment necessary to handle all repair work, all driven from an overhead line shaft which is belted to a 25-hp. three-phase, 600-volt induction motor. Energy is supplied to this motor through a three-phase line from the company's power house. The hoists in the repair shop include a hydraulic lift for handling armatures, motors and truck parts, and two 8-ton Yale & Towne chain blocks suspended from one of the roof trusses and used for lifting car bodies.



MESABA REPAIR SHOPS—GENERAL PLAN OF PROPERTY

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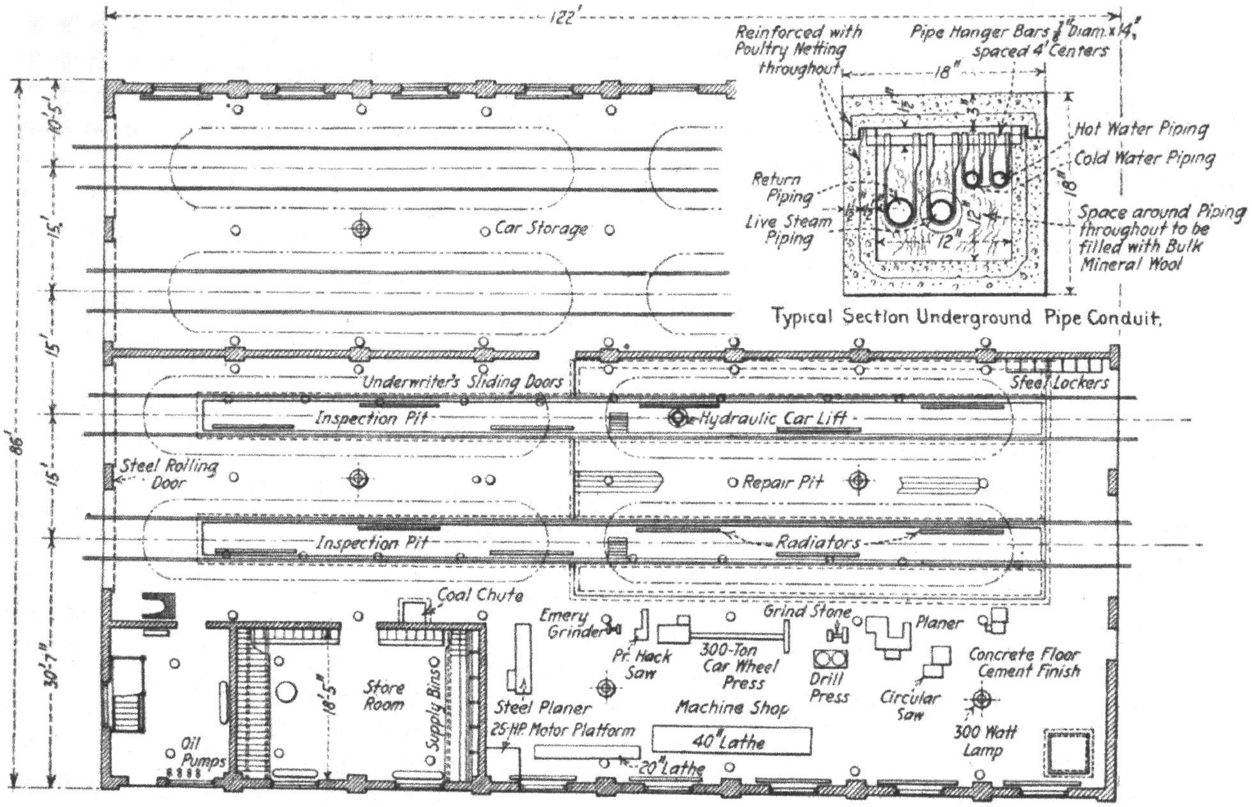
122'
Reinforced with Poultry Netting throughout
Pipe Hanger Bars ⅞" Diam. x 14" spaced 4' Centers
18"
Hot Water Piping
Cold Water Piping
Return Piping
Live Steam Piping
12"
18"
Space around Piping throughout to be filled with Bulk Mineral Wool
Typical Section Underground Pipe Conduit.
10'-5"
15'
15'
86'
15'
30'-7"
Car Storage
Underwriter's Sliding Doors
Steel Lockers
Inspection Pit
Hydraulic Car Lift
Steel Rolling Door
Repair Pit
Inspection Pit
Radiators
Coal Chute
Emery Grinder
Grind Stone
Planer
Pr. Hack Saw
300-Ton Car Wheel Press
Drill Press
Concrete Floor Cement Finish
Store Room
18'-5"
Supply Bins
Steel Planer
Machine Shop
Circular Saw
25 HP. Motor Platform
40" Lathe
300 Watt Lamp
Oil Pumps
20" Lathe

MESABA REPAIR SHOPS—PLAN OF SHOPS AND SECTION THROUGH PIPE CONDUIT

Energy for lighting is obtained from the 600-volt, single-phase motor service which is stepped down to 110 volts through a 7½-kva. transformer. All wiring in the carhouse is installed in conduit, and tungsten lamps on brewery cord drops furnish individual illumination. In addition to these six 300-watt nitrogen-filled lamps with Abolite shades were installed in the repair shop and car-storage bay for general illumination. All the lighting circuits are controlled from a cabinet situated in the passageway beside the storeroom.

Installed in the basement below the storeroom is a low-pressure heating plant of sufficient capacity to heat the repair shop, paint shop and office building, as well as the manager's residence, which is situated about 600 ft. from the carhouse. All radiation is of the wall type, except that in the storeroom and passageway, and is so installed on the walls and between the columns that the radiators occupy very little floor space. The radiation in the pits is fastened to the concrete walls and to the supporting timbers of the wooden constructed section. A hot water tank in the boiler room supplies the office and paint shop. In one corner of the boiler room four Bowser oil tanks containing lubricating and signal oils have been installed. These tanks are equipped with measuring pumps located on the main floor.

Situated about 60 ft. from the repair shop building is a brick and concrete paint shop, 20 ft. 8 in. x 64 ft. in size. The walls of this building are 9 in. thick with 4-in. x 26-in. pilasters, and the roof is a 3-in. reinforced-concrete slab supported on ten 9-in. I-beams and covered with a five-ply tar and gravel roof. Suitable ventilation is supplied by three Ohio Blower Company's 16-in., Swartwout, rotary ball-bearing ventilators. The size of this building is just sufficient to accommodate one car, one track of the yard lay-out passing through the building. The track entrances to this building are fitted with Kinnear steel rolling doors, and the window openings are equipped with Fenestra steel sashes glazed with ⅛-in. ribbed glass. Other construction details include concrete floors, wooden trolley trough and ten drop lights wired in conduit. Three attachment plug outlets on the side walls were supplied for extension cord connections.

OTHER FEATURES

The new office building is a two-story frame and brick structure situated 60 ft. from the car repair shop building. An unusual feature in the construction of this building was the provision of an entirely fireproof room to contain the dispatcher's equipment. This room is surrounded with 9-in. brick partition walls and has a reinforced-concrete ceiling and sub-floor. Openings from this room to the interior building are protected with Kinnear steel rolling fire doors. Added importance is given the protection of the dispatcher because his outfit includes a Simmen automatic railway signal dispatcher's board.

To protect the records of the road a 5-ft. 9-in. x 8-ft. 8-in. reinforced-concrete vault occupies one corner of the office building and extends the full height of the two floors. In connection with this vault it is interesting to note that the one now serving the first floor was formerly on the second floor of the original office building. At that time this vault was supported on steel columns and during the fire it fell from the second story to the ground. This caused no apparent injury and all the records in the vault were fully protected.

An interesting feature in connection with the electric wiring of the office building, as well as the manager's residence, is that the wiring provides for electrical heating. Separate circuits in conduit run from the lighting cabinet to baseboard receptacles in each office room. To these ordinary car bank-heaters are connected during the cold spring and autumn days when steam heat is unnecessary but some heat is required in the office and residence.

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MESABA RAILWAY COMPANY

INVESTMENT IN ROAD AND EQUIPMENT

	1 Inception to 3/1/1913	2 3-1-1913 to 6/30/1913 4 months	3 Additions Deductions 12 months	2 plus 3 3-1-1913 to 6/30/1914	12/31/1922	12/31/1923
ROAD						
Engineering & Superintendence	20,243	31	944	975	84,878	82,376
Right-of-Way	7,478	123	951	1,074	11,440	10,996
Other Land use in Operations	3,217				6,717	6,717
Grading	146,116		181	181	234,986	238,046
Ballast	39,894	11,748	5,700	17,448	80,238	78,459
Ties	53,290		20	20	70,420	72,745
Rail, Fastenings & Joints	140,575	366	163	529	195,100	191,200
Special Work	14,447	391	1,663	2,054	35,982	35,983
Track Laying & Surfacing	40,438	10,247	3,260	13,507	106,723	107,474
Paving	37,779	142	8,412	8,554	116,890	116,890
Roadway Machinery & Tools		1,021	(650)	371	1,180	1,017
Bridges, Trestles & Culverts	71,171		75	75	112,124	112,854
Crossings, Fences, Guards,Signs	1,695	750	432	1,182	5,047	5,085
Signal & Interlocking Apparatus	589	3,854	5,804	9,658	-	-
Telephone & Telegraph Lines	4,435	435	115	550	5,852	5,770
Poles & Fixtures	50,858	279	407	686	67,896	67,821
Distribution System	80,926	667	7,723	8,390	98,724	79,583
General Office Buildings	4,532	666	135	801	7,178	7,269
Shops & Carhouses	26,422	95	508	603	45,505	45,384
Stations & Waiting Rooms	2,447	824	4,469	5,293	34,601	34,826
Park & Resort Property					36	36
	746,554	31,639	40,312	71,951	1,321,518	1,300,532
EQUIPMENT						
Passenger & Combination Cars	94,239	3,069	3,142	6,202	124,606	122,812
Freight, Express & Mail Cars	11,816				12,601	12,601
Service Equipment	5,648				5,728	5,728
Electric Equipment of Cars		7		7	-	
Shop Equipment	2,757	1,088	147	1,235	5,026	5,026
Furniture					1,314	1,130
Misc. Rail Equipment		1,549	110	1,659	2,726	2,319
	114,460	5,704	3,399	9,103	152,002	149,617
POWER						
Power Plant Buildings	49,167	83	417	500	49,667	49,667
Substation Buildings	3,447	47	81	128	10,654	10,654
Power Plant Equipment	82,792	274	3,601	3,875	86,652	86,552
Substation Equipment	16,153		1	1	30,566	30,566
Transmission System	23,017	164	1,131	1,295	24,316	24,316
	174,577	568	5,231	5,799	201,855	201,855

	1 Inception to 3/1/1913	2 3-1-1913 to 6/30/1913 4 months	3 Additions Deductions 12 months	2 plus 3 3-1-1913 to 6/30/1914	12/31/1922	12/31/1923
GENERAL						
Law Expenditures	21,861		451	451	10,141	10,791
Interest during Construction	135,765				19,742	19,742
Injuries & Damages	5,509				47	47
Organization Expenses					1,317	1,317
Miscellaneous Expenses	115,472	170	5,186	5,356	5,485	5,485
	278,608	170	5,637	5,807	36,732	37,382
Cost of Road Purchased 3-1-1913#		2,200,000		2,200,000		
Total Investment	1,314,199	2,238,084	54,580	2,292,664		
Excess of Liabilities over Cost of Physical Assets assumed by Mass. Corporation in purchase of Assets of Minn. Corporation 7-21-1914					2,169,015	2,169,015
Total Investment					3,881,122	3,858,402
# Mortgage Bonds		1,100,000				
Common Stock		1,100,000				
		2,200,000				

MESABA RAILWAY CO.
INVESTMENT IN ROAD & EQUIPMENT
SUMMARY

Year Ended		Way & Structures	Equipment	Power	General & Misc.	Total
6/30/1914	Balance	2,278,988	7,869		5,807	2,292,664
6/30/1915	Recapitalization *	1,060,532				1,060,532
6/30/1915		55,962	2,153	161	1,108	63,383
		3,399,482	10,022	161	6,915	3,416,579
6/30/1916		15,535	1,698			17,232
		3,415,017	11,720	161	6,915	3,433,811
12/31/1916		34,799	2,382			37,181
Adjust to balance with account						(7,606)
						3,463,386
12/31/1917		13,906	354	315		14,574
						3,477,960
12/31/1918		5,788	273	1		6,062
						3,484,022
12/31/1919		10,327	1,239		1,870	13,438
						3,497,460
12/31/1920		1,827	1,727	102	5,954	9,610
						3,507,070
12/31/1921		1,007	3,521	1,732	5,570	11,830
						3,518,900
12/31/1922	New Construction and	325,327	18,658	19,419	22,222	385,626
	Abandonment					3,904,526
12/31/1923	Abandonment	(42,683)	(4,091)		650	(46,124)
						3,858,402
12/31/1924		5,108	282			5,390
						3,863,792
12/31/1925						-
						3,863,792
12/31/1926		(899)	(7,944)			(8,843)
						3,854,948

* Recapitalization 7-1-1914:

New Common Stock	1,575,000
New Preferred Stock	685,000
Total	2,260,000
Old Common Stock	(1,100,000)
Cash exchanged	(99,468)
Road & Equipment	1,060,532

Mesaba Railway, Virginia, Minn.—The Mesaba Railway has been reincorporated under the laws of Massachusetts with $3,750,000 of authorized stock to succeed the Minnesota corporation of the same name. The stock will consist of 12,500 shares of 7 per cent preferred stock and 25,000 shares of common stock. Of the stock, 15,757 shares of preferred and 6850 shares of common are to be issued in exchange for the outstanding $1,100,000 of stock of the Minnesota corporation and $99,168 cash. ERJ 7-11-1914

MESABA RAILWAY CO.						
BALANCE SHEETS						
	6/30/1913	6/30/1914	6/30/1915	6/30/1916	12/31/1916	12/31/1917
ASSETS						
Investment in Road & Equipment	2,238,084	2,292,664	3,416,579	3,433,811	3,463,386	3,477,960
Sinking Fund						62,301
Current Assets	17,026	86,670	94,429	71,953	73,029	57,965
Investments						3,250
Unadjusted Debits	1,310	8,165	12,941	12,126	11,198	16,717
Total Assets	2,256,420	2,379,334	3,524,449	3,517,890	3,547,613	3,618,194
LIABILITIES AND CAPITAL						
Current Liabilities	12,380	68,036	71,256	67,616	84,725	73,939
Unadjusted Credits	21,599	25,647	30,599	41,200	46,115	54,470
Mortgage Bonds	1,100,000	1,100,000	1,129,000	1,129,000	1,129,000	1,195,000
Income Bonds						
Common Stock	1,100,000	1,100,000	1,575,000	1,575,000	1,575,000	1,575,000
Preferred Stock 7%			685,000	685,000	685,000	685,000
Surplus	22,440	63,760	33,591	20,072	27,773	34,784
Total Liabilities and Capital	2,256,420	23,574,923	3,524,449	3,517,890	3,547,613	3,618,194

Unadjusted Debits included Discount on Funded Debt.

Unadjusted Credits included Accumulated Depreciation and Reserves.

Road and Equipment	2,233,297		
Other	4,787		
	2,238,084		
Current Liabilities included:			
Accrued Interest and Dividends			
Receivers Certificates			
First Mortgage Bonds Authorized	2,500,000	5% 1912-1932	
Issued and Outstanding	1,100,000		
Stockholders	8	?	20
Employees:			
Officers		5	
Office Clerks		6	
Maintenance-Superintendence		1	
Maintenance- Employees		89	
Transportation-Employees		43	
Total		144	

MESABA RAILWAY CO.						
BALANCE SHEETS						
	12/31/1918	12/31/1919	12/31/1920	12/31/1921	12/31/1922	12/31/1923
ASSETS						
Investment in Road & Equipment	3,484,022	3,497,459	3,507,069	3,518,900	3,904,526	3,858,402
Sinking Fund	69,749	138,966	182,094	227,299	272,839	290,671
Current Assets	66,267	77,879	87,098	59,625	64,436	66,176
Investments	2,500	5,000	5,000	5,000		
Unadjusted Debits	17,652	16,506	16,532	17,814	12,404	11,347
Total Assets	3,640,190	3,735,810	3,797,794	3,828,637	4,254,205	4,226,596
LIABILITIES AND CAPITAL						
Current Liabilities	33,816	35,173	31,345	39,906	71,979	110,718
Unadjusted Credits	56,119	60,616	53,521	34,116	65,570	321,595
Mortgage Bonds	1,195,000	1,211,000	1,211,000	1,211,000	1,211,000	1,211,000
Income Bonds					370,000	370,000
Common Stock	1,575,000	1,575,000	1,575,000	1,575,000	1,575,000	1,575,000
Preferred Stock 7%	685,000	685,000	685,000	685,000	685,000	685,000
Surplus	95,255	169,021	241,928	283,614	275,556	(46,717)
Total Liabilities and Capital	3,640,190	3,735,810	3,797,794	3,828,637	4,254,205	4,226,596
Unadjusted Debits included Discount on Funded Debt.						
Unadjusted Credits included Accumulated Depreciation.					38,990	291,941
Current Liabilities included:						
Accrued Interest and Dividends						
Receivers Certificates						

MESABA RAILWAY CO.				
BALANCE SHEETS				
	12/31/1924	12/31/1925	12/31/1926	
ASSETS				
Investment in Road & Equipment	3,863,792	3,863,792	3,854,948	
Sinking Fund	293,548	318,515	294,134	
Current Assets	51,144	52,988	66,773	
Investments			38,277	#
Unadjusted Debits	10,055	8,990	6,692	
Total Assets	4,218,539	4,244,285	4,260,824	
LIABILITIES AND CAPITAL				
Current Liabilities	125,956	272,613	351,120	
Unadjusted Credits	357,102	398,051	435,627	
Mortgage Bonds	1,211,000	1,211,000	1,211,000	
Income Bonds	370,000	370,000	370,000	
Common Stock	1,575,000	1,575,000	1,575,000	
Preferred Stock 7%	685,000	685,000	685,000	
Surplus	(105,520)	(267,379)	(366,922)	
Total Liabilities and Capital	4,218,539	4,244,285	4,260,824	
Unadjusted Debits included Discount on Funded Debt.				
Unadjusted Credits included Accumulated Depreciation.	341,429	386,999	426,554	
Current Liabilities included:				
Accrued Interest and Dividends	80,284	232,666	316,885	
Receivers Certificates	10,000			
# Investment in affliliated company.			38,277	

MESABA RAILWAY COMPANY

INCOME & EXPENSE STATEMENTS

	Year Ended 6/30/1913	Year Ended 6/30/1914	Year Ended 6/30/1915	Year Ended 6/30/1916	Year Ended 12/31/1916	Year Ended 12/31/1917	Year Ended 12/31/1918
OPERATING REVENUE							
Passenger	81,552	243,534	203,680	212,101	236,814	274,730	250,275
Baggage		1,192	1,144	1,365	1,251	1,163	943
Special Car		1,145	2,697	1,654	2,811	3,669	1,438
Mail							
Express		4,876	5,931	6,966	7,242	7,320	7,300
Milk		303	98	112	128	213	239
Freight							
Misc. Transportation		4		240		1	
Other Operating	95	925	1,540	794	858	828	808
Total	81,647	251,979	215,089	223,232	249,104	287,925	261,004
OPERATING EXPENSE							
Maintenance of Way & Structures	(5,238)	(17,335)	(12,962)	(14,444)	(11,458)	(11,385)	(16,758)
Maintenance of Equipment	(3,801)	(11,979)	(8,212)	(9,429)	(9,214)	(11,013)	(10,616)
Power	(9,391)	(22,747)	(25,439)	(18,301)	(13,090)	(46,391)	(20,905)
Transportation	(12,841)	(38,058)	(36,834)	(36,236)	(39,143)	(42,580)	(46,766)
Traffic	(1,393)	(3,149)	(711)	(607)	(571)	(419)	(447)
General & Miscellaneous	(7,983)	(32,461)	(30,024)	(29,692)	(27,364)	(34,488)	(32,483)
Total	(40,651)	(125,728)	(114,183)	(108,708)	(100,840)	(146,726)	(127,975)
Operating Profit (Loss)	40,996	126,251	100,906	114,254	148,264	141,199	133,029
Taxes	(3,266)	(13,087)	(11,372)	(12,249)	(13,490)	(18,079)	(18,718)
Interest	(18,319)	(56,845)	(57,556)	(57,452)	(57,764)	(58,764)	(56,693)
Amortize Discount on Mtg Bonds			(471)	(528)	(528)	(980)	(1,022)
Miscellaneous. Debits			(13,318)	(10,608)	(18,599)	(23,013)	(14,802)
Non-Operating Income			1,872	329	376	574	620
Net Profit (Loss)	19,411	56,319	20,062	34,017	58,259	41,387	42,415
Operating Ratio	49.8%	49.9%	53.1%	48.7%	40.5%	51.0%	49.0%
Dividends Paid		19,250	44,250	47,950	47,950	35,693	
Revenue Passengers	450,638	1,565,783	1,318,531	1,428,646	1,572,108	1,784,738	1,694,517

MESABA RAILWAY COMPANY								
INCOME & EXPENSE STATEMENTS								
	Year Ended 12/31/1919	Year Ended 12/31/1920	Year Ended 12/31/1921	Year Ended 12/31/1922	Year Ended 12/31/1923	Year Ended 12/31/1924	Year Ended 12/31/1925	Year Ended 12/31/1926
OPERATING REVENUE								
Passenger	305,734	315,354	269,337	243,263	246,934	173,512	188,149	184,958
Baggage	1,065	1,086	1,082	947	1,016	844	731	563
Special Car	1,308	690	170	906	1,234	1,062	405	354
Mail								
Express	8,793	8,497	9,791	10,088	11,789	6,407	4,721	4,997
Milk	373	428	386	322	342	279	287	313
Freight								
Misc. Transportation								
Other Operating	730	768	760	2,243	1,134	1,050	1,283	2,388
Total	318,054	326,823	282,127	257,769	262,449	183,154	195,577	193,573
OPERATING EXPENSE								
Maintenance of Way & Structures	(21,142)	(21,871)	(18,616)	(20,854)	(53,155)	(55,149)	(64,612)	(54,931)
Maintenance of Equipment	(13,622)	(19,031)	(21,350)	(15,946)	(27,174)	(24,957)	(21,419)	(23,039)
Power	(23,823)	(25,279)	(24,719)	(31,885)	(44,073)	(40,182)	(36,037)	(32,807)
Transportation	(54,680)	(62,654)	(64,924)	(70,591)	(72,494)	(63,242)	(46,139)	(40,944)
Traffic	(624)	(1,123)	(1,280)	(1,146)	(1,028)	(2,223)	(2,431)	(2,313)
General & Miscellaneous	(37,664)	(41,541)	(39,941)	(38,860)	(39,903)	(43,819)	(50,185)	(52,961)
Total	(151,555)	(171,498)	(170,829)	(179,282)	(237,826)	(229,572)	(220,823)	(206,905)
Operating Profit (Loss)	166,499	155,325	111,298	78,487	24,623	(46,418)	(25,246)	(13,332)
Taxes	(24,963)	(25,044)	(19,333)	(13,497)	(13,605)	(9,479)	(9,779)	(9,679)
Interest	(55,644)	(53,567)	(51,437)	(71,433)	(69,662)	(13,126)		
Amortize Discount on Mtg Bonds	(1,115)	(1,076)	(1,033)	(1,407)	(947)	(174)	(696)	
Miscellaneous. Debits	(14,406)	(9,593)	(4,212)	(3,846)	(8,837)	400	(103)	(271)
Non-Operating Income	641	1,555	1,625	1,704	1,348	1,087	2,023	1,854
Net Profit (Loss)	71,011	67,599	36,905	(9,993)	(67,081)	(67,708)	(33,802)	(21,518)
Operating Ratio	47.7%	52.5%	60.6%	69.6%	90.6%	125.3%	112.9%	106.9%
Dividends Paid								
Revenue Passengers	2,037,903	2,114,000	1,795,265	1,956,634	2,125,115	1,731,295	1,787,938	1,470,981

Comparative Income Account, Years Ended June 30

	1917	1916	1915	1914	1913	1912
Gross earnings	$588,256	$518,922	$500,735	$474,395	$431,850	$388,255
Operating expenses	489,056	427,354	427,083	416,340	352,215	312,203
Net earnings	$99,200	$91,568	$73,652	$58,055	$79,635	$76,502
Other income	5,666	6,007	5,641	5,099	4,891	3,719
Total net income	$104,866	$97,575	$79,293	$63,154	$84,526	$79,771
Interest	19,388	16,665	19,131	14,295	11,034	7,419
Balance	$85,478	$80,910	$60,162	$48,859	$73,492	$72,352
Dividends paid	67,200	67,200	56,000	50,400	61,600	61,600
Surplus	$18,278	$13,710	$4,162	(def.) $1,541	$11,892	$10,752
Earned on stock	15.3%	14.4%	10.7%	8.7%	13.1%	12.9%

Bonded Debt: $50,000 4% coupon notes; due Jan. 1, 1919; interest paid Jan. and July 1st.

Capital Stock: Authorized and issued, $560,000; par $100. All owned by Massachusetts Gas Companies. Dividends in recent years: 1910, 8%; 1911, 12%; 1912 and 1913, 11%; 1914, 9%; 1915, 10%; 1916 and 1917, 12% each.

MESABA RAILWAY COMPANY

History: Incorporated June 27, 1914, under Massachusetts laws, as successor to a company of the same name incorporated under Minnesota laws in January, 1911, which succeeded the Mesaba Elec. Ry. of Minnesota. Connects towns of Hibbing, Chisholm, Buhl, Mountain Iron, Virginia, Eveleth and Gilbert. Put in operation in 1913. Length of line 28 miles on private right of way, except in towns, with steam road construction. Total mileage, about 35 miles. Population served, about 50,000.

Management: OFFICERS: Oscar Mitchell, Pres., Duluth; R. W. Watson, Vice-Pres., New York; A. S. Whiting, Sec., Duluth; P. L. Saltonstall, Treas., Boston. DIRECTORS: Oscar Mitchell, R. W. Watson, P. L. Saltonstall, C. A. Duncan, W. P. Chinn, H. S. Graham, A. B. Coates. ANNUAL MEETING: Second Monday in January at Boston. OFFICE: Duluth, Minn.

Comparative Income Account, Years Ended Dec. 31

	1917	1916	1915	1914
Gross earnings	$287,925	$249,104	$201,036	$236,280
Operating expenses and taxes	167,582	116,764	112,987	127,118
Net earnings	$120,343	$132,340	$88,049	$109,162
Interest charges	58,190	57,388	57,181	54,749
Balance	$62,153	$74,952	$30,868	$54,413
Margin of safety	**52%**	**59%**	**36%**	**50%**

Note: Margin of safety is the proportion of total net income left over after deduction of all charges, including interest on permanent and floating debts, sinking funds, etc.

Comparative Balance Sheet, as of Dec. 31

ASSETS:	1917	1916	1915
Road and equipment	$3,477,960	$3,463,386	$3,426,049
Investments	3,250	....	....
Materials and supplies	25,911	22,717	21,906
Advance payments	379	19,938	1,973
Notes receivable	....	....	599
Accounts receivable	351	7,111	3,268
Suspense	1,712	10,077	10,519
Cash	11,661	10,263	35,707
Sinking fund	62,301	14,121	....
Bond discount and expense	14,477	....	....
Special deposit	20,042	....	....
Total	$3,618,044	$3,547,613	$3,500,021
LIABILITIES:			
Common stock	$1,575,000	$1,575,000	$1,575,000
Preferred stock	685,000	685,000	685,000
First mortgage bonds	1,195,000	1,129,000	1,129,000
Notes payable	....	44,375	14,375
Liberty loan subscription	2,000	....	....
Accounts payable	51,398	21,265	18,860
Accounts not yet due	32,416	28,959	29,753
Reserves and surplus	77,230	64,014	48,033
Total	$3,618,044	$3,547,613	$3,500,021

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MESABA RAILWAY COMPANY

History: Incorporated June 27, 1914, under Massachusetts laws, as successor to a company of the same name incorporated under Minnesota laws in January, 1911, which succeeded the Mesaba Elec. Ry. of Minnesota. Connects towns of Hibbing, Chisholm, Buhl, Mountain Iron, Virginia, Eveleth and Gilbert. Put in operation in 1913. Length of line 28 miles on private right of way, except in towns, with steam road construction. Total mileage, about 35 miles. Population served, about 50,000.

Management: OFFICERS: Oscar Mitchell, Pres., Duluth; R. W. Watson, Vice-Pres., New York; Janet Macaulay, Sec., Duluth; Lester E. Flint, Treas. and Clerk, Boston. DIRECTORS: Oscar Mitchell, Jay Cooke, C. R. Ford, C. A. Duncan, W. P. Chinn, H. S. Graham, A. B. Coates. ANNUAL MEETING: Second Monday in January at Boston. OFFICE: Virginia, Minn.

Comparative Income Account, Years Ended Dec. 31

	1920	1919	1918	1917	1916	1915
Gross earnings	$326,823	$318,053	$261,004	$287,925	$249,104	$201,036
Operating expenses, taxes, etc.	199,863	192,039	162,517	175,405	116,764	112,987
Net earnings	$126,960	$126,014	$98,487	$112,520	$132,340	$88,049
Interest charges	52,012	55,003	56,072	58,190	57,388	57,181
Balance	$74,948	$71,011	$42,415	$54,329	$74,952	$30,868
Margin of safety	59%	56%	43%	48%	59%	36%
Earned on preferred	10.9%	10.3%	6.2%	7.9%	10.9%	4.6%

Note: For explanation of Margin of Safety, etc., see pages 16 to 18.

Comparative Balance Sheet, as of Dec. 31

ASSETS:	1920	1919	1918	1917	1916
Road and equipment	$3,507 070	$3,497,459	$3,484,022	$3,477,960	$3,463,386
Investments	5,000	5,000	2,500	8,250	....
Materials and supplies	45,585	89,902	82,424	25,911	22,717
Advance payments	3,230	1,538	2,216	379	19,938
Accounts receivable	297	1,955	252	351	7,111
Suspense	1,402	1,506	2,386	1,712	10,077
Cash	20,858	15,768	13,399	11,661	10,263
Sinking fund	182,094	138,966	69,749	62,301	14,121
Bond discount and expense	11,899	13,462	13,050	14,477	....
Special deposit	20,358	20,258	20,192	20,042	....
Total	$3,797,793	$3,735,809	$3,640,190	$3,618,044	$3,547,613
LIABILITIES:					
Common stock	$1,575,000	$1,575,000	$1,575,000	$1,575,000	$1,575,000
Preferred stock	685,000	685,000	685,000	685,000	685,000
First mortgage bonds	1 211,000	1,211,000	1,195,000	1,195,000	1,129,000
Notes payable	....	....	....	....	44,375
Suspense, etc.	....	....	1,867	2,000	....
Accounts payable	11,224	15,052	11,244	51,398	21,265
Accounts not yet due	36,764	36,247	33,255	32,416	28,959
Reserves and surplus	278,805	213,510	138,824	77,230	64,014
Total	$3,797,793	$3,735,809	$3,640,190	$3,618,044	$3,547,613

Table A.—Bond Records and Ratings (Based on Five Year Income Results, Etc.)

NAME OF ISSUE	Interest Payable	Maturity	Authorized	Outstanding	Average Income Available	Interest Required Per Annum	Factor of Safety	BASIS FOR RATING		Net Rating
								Security	Salability	
1. Mesaba Ry. 1st 5s	M&S 1	Mr.1,1932	$2,500,000	$1,211,000	$119,261	$60,550	50%	Large	Fair	Baa.

Note: For Key to Ratings and full information, see pages 11 to 18.

REFERENCE NOTE ON BOND ISSUE:

1. Dated March 1, 1912; due March 1, 1932. Interest paid at American Trust Co., Boston, Trustee. Coupon, $1,000. Unissued bonds reserved for additions and improvements. Callable for sinking fund at 105 and interest. Sinking fund 2½% of total bonds certified, began Jan. 1, 1917. In sinking fund Jan. 1, 1921, $185,000. First lien on about 36 miles of road. Company pays normal income tax of 2%.

Table B.—Stock Records and Ratings (Based on Five Year Income Results, Etc.)

NAME OF ISSUE	Rate of Dividend	Amount Outstanding	Average Income Available	Dividend Requirement	Factor of Safety	BASIS FOR RATING		Net Rating
						Equity	Salability	
1. Mesaba Railway Co. 7% cum. pref	See text	$685,000	$63,531	$47,950	25%	Fair	Small	Caa.
2. Mesaba Railway Co. common	none	1,575,000	15,581	....	....	Small	......	C.

Note: For Key to Ratings and full information, see pages 11 to 18. For reference note, see next page.

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FINANCIAL

Afer discontinuance of operations in April 1927 it took until December 1927 to complete disposal of the property. Known dispositions are as follows.

Rails and overhead wire and fittings were sold to the Duluth Iron & Metal Co. for $84,300. May 1927

Trucks and motors from all the rolling stock were sold to the Duluth Iron & Metal Co. for $5,000. June 1927

All bridges and trestles sold to the Elizabeth Mining Co. for $3,500. June 1927

The Virginia carhouse and office buildings sold to the Minnesota Highway Department for $15,000.

The Hibbing terminal building was sold to Reed-Hynes-Quinlan Co., an automobile dealer, for $16,100.

COST OF HIBBING-CHISHOLM RELOCATION

Total cost of construction was $486,110.93. Apparently Mesaba Ry. Co. directly paid part of the construction costs. On 1-1-1922 Income 6% Gold Bonds due 3-1-1931 were issued to Oliver Iron Mining Co. in the amount of $370,000.00 to cover expenditures made by them.

TRACK AND OVERHEAD CONSTRUCTION

Some unusual difficulties were encountered in the construction of the railway although the topography was slightly rolling country. Large piles of earth stripping removed from the surface of the open-pit iron mines would have entailed prohibitive grading costs to build through so it was decided to build around them with easy curves and at the same time obtain a reasonable grade line. Numerous sink-holes and bogs made it practically impossible to obtain permanent bearings, and at other points the road was constructed through fields of large boulders.

General contractor was the Western Construction Co., owned by stockholders of the Mesaba Ry. Co. Grading was performed by John Runquist of Duluth. The Cleveland Construction Co. of Cleveland, Ohio, was the subcontractor for all electrical design and construction. Bridges and trestles were built by the Gallagher Bridge and Construction Co.

The line was built on private right-of-way 50 ft. in width through the rural areas, and in streets through cities and villages. As the rural population was very small with little or no farming, it was unnecessary to fence the right-of-way. There were few streams requiring bridging and the only waterways of any consequence were a few shallow lakes. Numerous railroad crossings were necessary; crossings at grade were used only where a grade separation was not feasible or railroad traffic was very light. The standard roadway construction involved a 14 ft. roadbed on embankments with 3 ft. ditches on each side in excavation. Six inches of gravel ballast, taken from a pit on the right-of-way, was then placed on which was laid 6" x 8" X 8' tamarack ties and A.S.C.E. 70 lb. rail. Certain sections in paved streets used 72 lb. rail. Carhouse tracks were laid with 60 lb. rail. Ohio Brass Co. compressed terminal bonds of the concealed type with exposed terminals were used for ease in locating defective bonds.

The 4/0 grooved trolley wire was supported by pipe mast-arms attached to 40 ft. Idaho cedar poles which also carried the telephone, signal and transmission line wires. Some span wire construction, using wooden poles on right-of-way and steel poles on streets, was erected through Hibbing, Chisholm, Buhl, Virginia, Eveleth and Gilbert.

When the line first opened the Simmen system of block signals, using home and distant third rails each 70 ft. long, was installed to protect the single track between sidings which were located at approximately six-mile intervals. Signal lights in the motorman's cab were operated from the third rails by contact shoes mounted on the front truck of each motor car. A directional movement protection feature was included. A system of outside signal lights operated in conjunction with the Simmen system were used in Hibbing and Gilbert because the terminals were located on paved streets where the third rails could not be installed. Use of this system was eventually discontinued and the equipment removed.

The Minnesota Railroad & Warehouse Commission approved the abandonment and relocation of the track between Hibbing and Chisholm 8-7-1919. The newly completed track was inspected by the MRR&WC 12-5-1921 and licensed 12-8-1921. Its report described the track as follows.

Main roadway: one mile west of Chisholm to Railroad St., New Hibbing:	8.19 miles
Sidings: 1st Ave., Howard St. to Alexander St., Hibbing:	.57 miles
Total track (all laid with 100 lb. rail)	8.76 miles

Map correction: the Hibbing waiting station wye tail track was located alongside the building and not in the street.

A track relocation project in Virginia involved 1.20 miles of new track construction which was inspected by the MRR&WC 11-14-1923 and licensed 1-17-1924.

MESABA RAILWAY CO.						
TRACK MILEAGE						
		First Main		Carhouse	Total	
Year Ended		Track	Sidings	Track	Track	
6/30/1913	and					
6/30/1914		34.800	0.900		35.700	
6/30/1915		34.800	0.871	0.684	36.355	
6/30/1916		34.800	0.871	0.684	36.355	
12/31/1916		34.800	0.871	0.684	36.355	
12/31/1917		34.970	0.871	0.684	36.525	
12/31/1918	through					
12/31/1921		35.000	0.871	0.684	36.555	
12/31/1922	and					
12/31/1924		38.80	2.07	0.68	41.55	
12/31/1923	and					
12/31/1925	/1926	38.33	2.07	0.68	41.08	
New track construction inspected by Minn. Railroad & Warehouse Commission:						
1. One mile west of Chisholm to Railroad St., New Hibbing						
12-5-1921		8.19				
2. First Ave., Howard St. to Alexander St., Hibbing						
12-5-1921			0.57		8.76	
3. In Virginia						
11-14-1923		1.20				

Switch Locations
(Relocated Line)

Hibbing Park: double end siding.
Hibbing-7th Ave. & Howard St.: wye.
Hibbing Carhouse: two tracks.
Hibbing Waiting Station: wye.
Mitchell-East Hibbing: siding.
Glen Spur (Station 8): siding.
Ballast-West Chisholm: siding.
Chisholm Waiting Station: wye.
Boulder: siding.
Buhl (west end): wye.
Runquist: siding.
Williams: siding.
Center: siding.
Brunt: siding.
D.M.&N. Ry.: connecting track.
Virginia Carhouse: lead track switch, siding, 9 storage track switches.
Virginia: wye.
South Virginia-Thomas: siding.
Summit Gravel Pit: siding.
Eveleth: wye.
Sparta: siding.
Gilbert (east end): wye.

Bridges & Trestles
(Relocated Line)

North Hibbing:	100 ft.	steel bridge over the D. M. & N. Ry.
Mitchell:	1221 ft.	timber trestle with two steel spans over four tracks of the G.N. Ry. and D.M.&N. Ry.
Chisholm lake:	1920 ft.	timber trestle.
West of Buhl:	405 ft.	timber trestle with one steel span over the G. N. Ry.
West of Station 16:	45 ft.	timber trestle.
East of Station 16:	105 ft.	timber trestle.
Sharon:	780 ft.	timber trestle with one steel span over the D.M.& N. Ry.
Kinney:	1110 ft.	timber trestle with one steel span over the G.N. Ry. and D.M.&N. Ry.
East Kinney:	150 ft.	timber trestle.
East Kinney derail:	90 ft.	timber trestle.
Ellis:	120 ft.	timber trestle.
Kinross:	90 ft.	timber trestle.
Center siding:	225 ft.	timber trestle.
Brunt siding:	75 ft.	timber trestle.
East Parkville:	15 ft.	timber trestle.
West of Virginia carhouse:	930 ft.	timber trestle with one steel span over the Canadian Northern Ry. built in 1914.
Virginia-Oliver Shop:	345 ft.	timber trestle.
Virginia-Bailey Mill:	750 ft.	timber trestle.
Thomas siding:	75 ft.	steel bridge, owned by the D.M.&N. Ry.
Eveleth:	705 ft.	timber trestle.
Sparta:	60 ft.	timber trestle.

Railroad Grade Crossings
(Relocated Line)

South Hibbing-1st Ave.:	4 tracks.	
Glen Spur (Station 8):	2 tracks.	
Chisholm, east of the wye:	3 tracks.	
Kinney:	1 track.	Derail located at Station 23.
Brunt (Station 29½):	1 track.	Derail located at Station 29½..
Virginia, west of the carhouse:	1 track.	Derail located 1000 ft. west of the carhouse.
Virginia-North Side:	2 tracks.	
Virginia-Oliver Shop:	1 track.	
Virginia-Bailey Mill:	1 track.	Derail located at the bridge.
South Virginia:	2 tracks.	

Highway Grade Crossings
(Relocated Line)

North Hibbing.
South Hibbing.
Station 10 (Hibbing-Chisholm highway).
West end of Chisholm.
East end of Chisholm.
Station 23½ (Virginia-Hibbing highway).
West of the Virginia carhouse.
Virginia-North Side.
Virginia-South Side.
Station 40 (Virginia-Gilbert highway).
East end of Eveleth streets.
West end of Gilbert streeets.

Track in Paved Streets
(Original Line)

Hibbing

From 3rd Ave. and McKinley St., on 3rd Ave., Pine St., and 1st Ave. to 668 ft. north of Seller's Bridge (on 1st Ave.):	5868 l.f.	1.11 miles
Track abandoned in 1921 was from 3rd Ave. and Railroad St., on 3rd Ave., Pine St. and 1st Ave. to 668 ft. north of Seller's Bridge:	(3418 l.f.)	(0.65 miles)

Chisholm

On Center St. (Central Ave.) from 1st St. N.W. to Lake St. and on Lake St. from Center St. to 4th Ave.:	2169 l.f.	.41 miles

In 1914 concrete was placed between the rails on Lake St. from 4th Ave. to one block west. During 1915-1916 concrete paving was placed around the wye tracks.

Buhl

On Culver Ave. from State St. to Wanless St., and on State St. from Culver Ave. to 450 ft. west of Mercer Ave.:	2850 l.f.	.54 miles

Virginia

On 9th St. N. from the first gate at Olcott Park east to 3rd Ave., on 3rd Ave. from 9th St. N. to 10th St. S., on 10th St. S. from 3rd Ave. to 2nd Ave., and on 2nd Ave. from 10th St. to 800 ft. south of 11th St.:	7805 l.f.	1.48 miles
In 1918 additional paving was placed at the south end of 2nd Ave. near the approach to the D.M.&N. Ry. viaduct. A later listing indicated paving extended as far south as 13th St.		

Eveleth

On Adams Ave. from Harrison St. to Fayal Road, and on Fayal Road from Adams Ave. to Bridge 614:	5160 l.f.	.98 miles

Gilbert

On Broadway from Nebraska Ave. to 150 ft. east of Indiana Ave.: This was done during 1916-1917 at which time an additional 900 l.f. of track using 70 lb. rail was laid.	2850 l.f.	.54 miles

Total

Total of the foregoing quantities listed **before** the 1921 Hibbing abandonments:	26702 l.f.	5.06 miles

Hibbing 1919-1921

Track constructed on 1st Ave. from the G.N. Ry. crossing south to Alexander St., and on Howard St. from 1st Ave. eastward, was all paved with concrete.

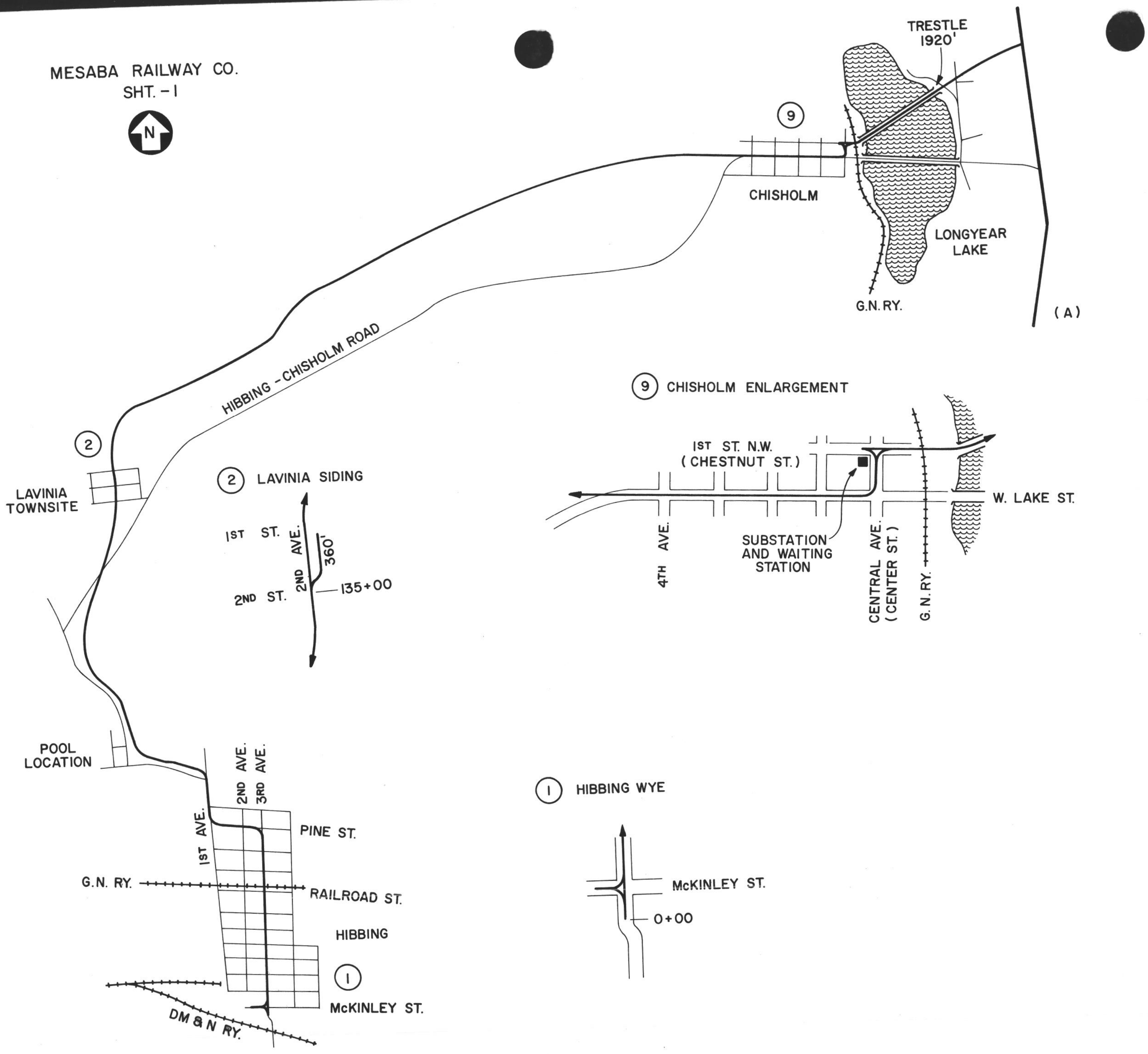
Maintenance of Way

There were originally four sections: Hibbing to Boulder, Boulder to Kinross, Kinross to the DM&N Ry. crossing, and from that crossing to Gilbert.

Subsequently this was re-organized into three sections, each operating from an 8' x 10' section-car house. These three houses were located at the Chisholm Waiting Station, Mountain Iron, and the Virginia Carhouse. Equipment consisted of three handcars, three push cars, one heavy rail car, six track jacks (two on each section), and two wrecking cables.

MESABA RAILWAY CO.

SHT. - I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TRESTLE 1920'
⑨
CHISHOLM
LONGYEAR LAKE
G.N. RY.
(A)
HIBBING - CHISHOLM ROAD
②
LAVINIA TOWNSITE
② LAVINIA SIDING
1ST ST.
2ND AVE.
360'
2ND ST.
135+00
⑨ CHISHOLM ENLARGEMENT
1ST ST. N.W. (CHESTNUT ST.)
W. LAKE ST.
4TH AVE.
SUBSTATION AND WAITING STATION
CENTRAL AVE. (CENTER ST.)
G. N. RY.
POOL LOCATION
2ND AVE.
3RD AVE.
1ST AVE.
PINE ST.
G.N. RY.
RAILROAD ST.
HIBBING
①
McKINLEY ST.
DM & N RY.
① HIBBING WYE
McKINLEY ST.
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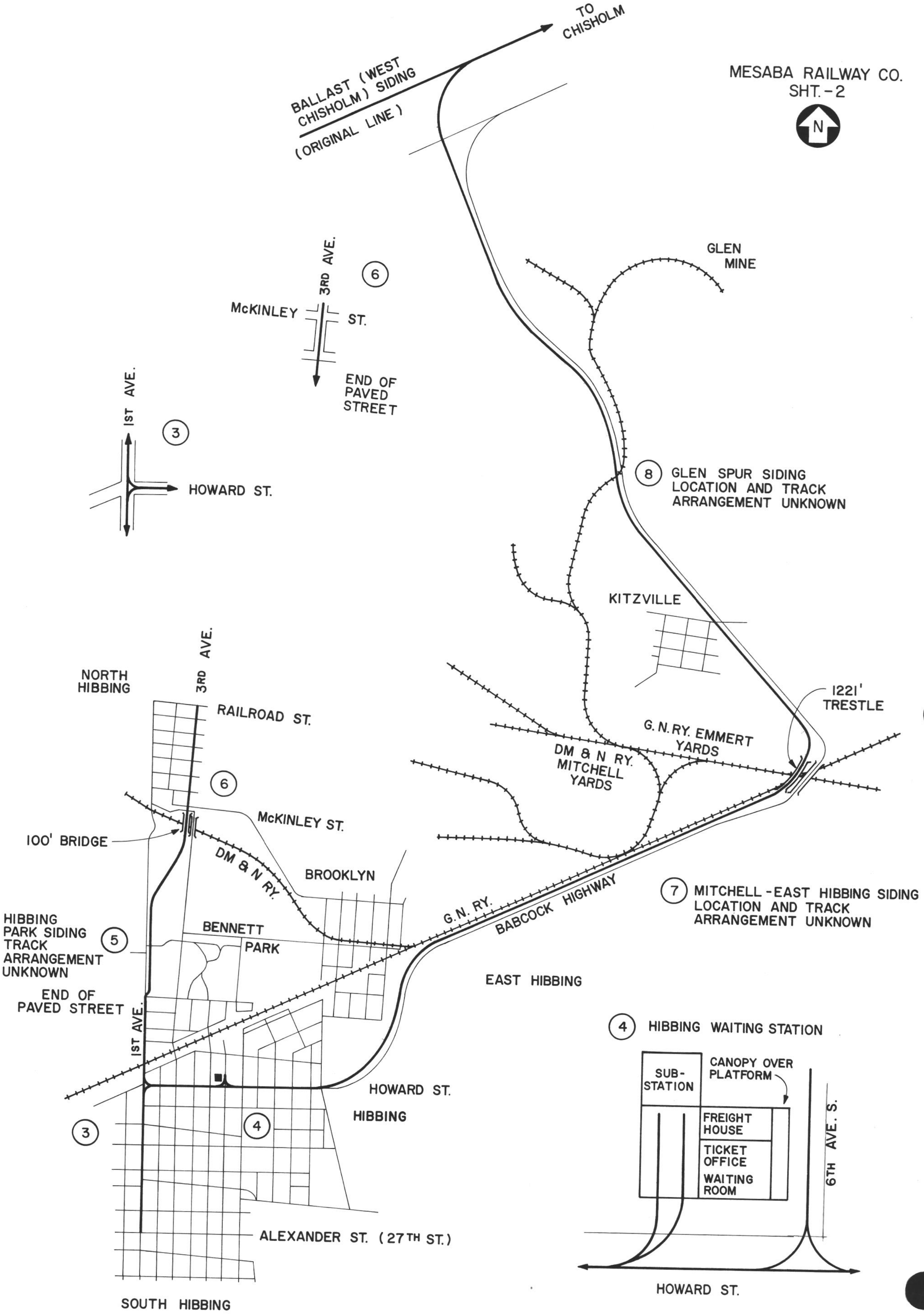
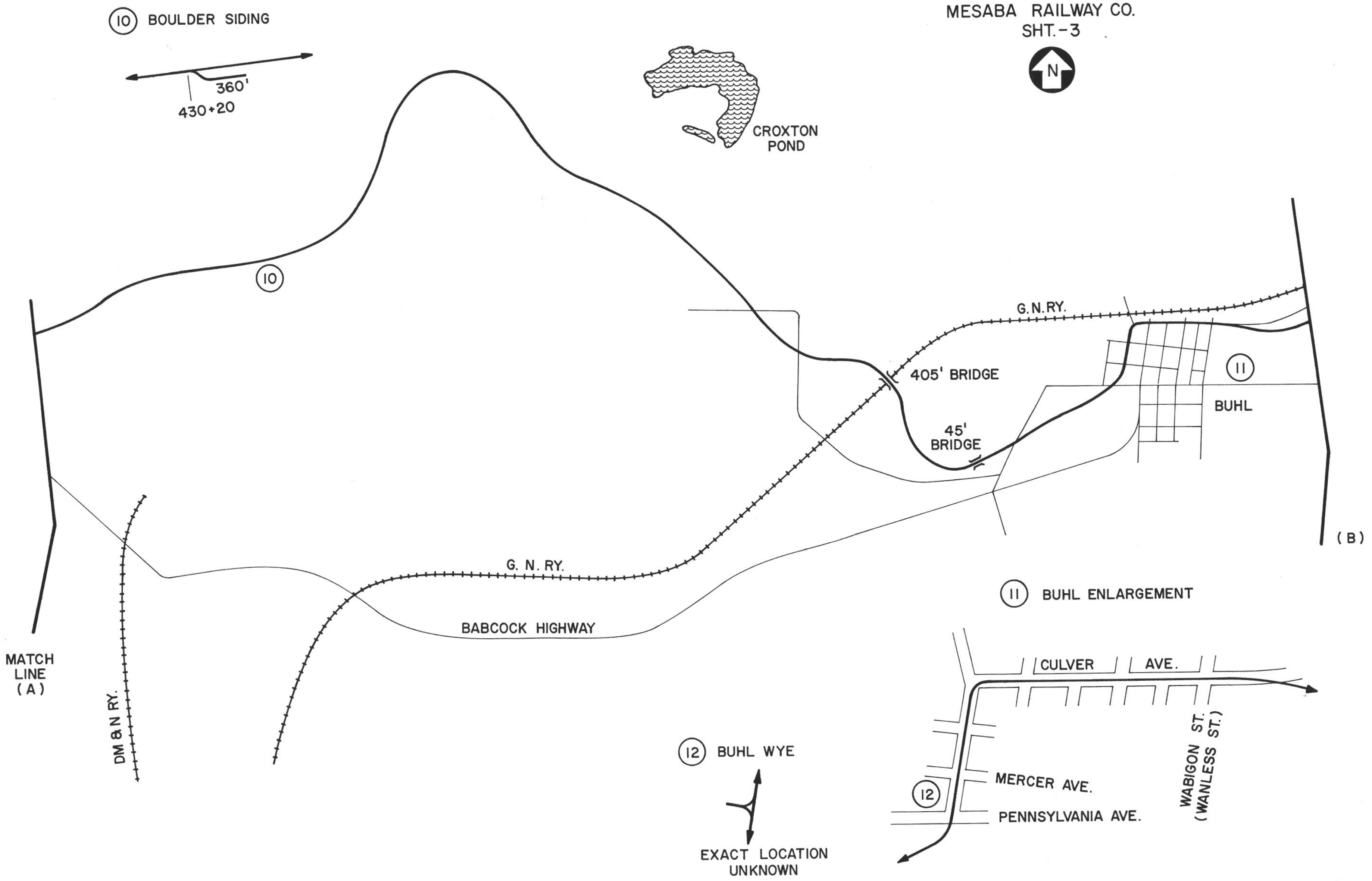

MESABA RAILWAY CO.
SHT.-2
N
TO CHISHOLM
BALLAST (WEST CHISHOLM) SIDING
(ORIGINAL LINE)
GLEN MINE
3RD AVE.
6
McKINLEY
ST.
END OF PAVED STREET
1ST AVE.
3
HOWARD ST.
8
GLEN SPUR SIDING LOCATION AND TRACK ARRANGEMENT UNKNOWN
KITZVILLE
1221' TRESTLE
G. N. RY. EMMERT YARDS
DM & N RY. MITCHELL YARDS
NORTH HIBBING
3RD AVE.
RAILROAD ST.
6
McKINLEY ST.
100' BRIDGE
DM & N RY.
BROOKLYN
G. N. RY.
BABCOCK HIGHWAY
7
MITCHELL-EAST HIBBING SIDING LOCATION AND TRACK ARRANGEMENT UNKNOWN
HIBBING PARK SIDING TRACK ARRANGEMENT UNKNOWN
5
BENNETT PARK
EAST HIBBING
END OF PAVED STREET
1ST AVE.
4
HIBBING WAITING STATION
SUB-STATION
CANOPY OVER PLATFORM
FREIGHT HOUSE
TICKET OFFICE
WAITING ROOM
6TH AVE. S.
HOWARD ST.
3
4
HOWARD ST.
HIBBING
ALEXANDER ST. (27TH ST.)
SOUTH HIBBING

MESABA RAILWAY CO.
SHT.-3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405' BRIDGE
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DM & N RY.
G. N. RY.
BABCOCK HIGHWAY
⑪ BUHL ENLARGEMENT
CULVER AVE.
MERCER AVE.
PENNSYLVANIA AVE.
WABIGON ST.
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⑫ BUHL WYE
EXACT LOCATION
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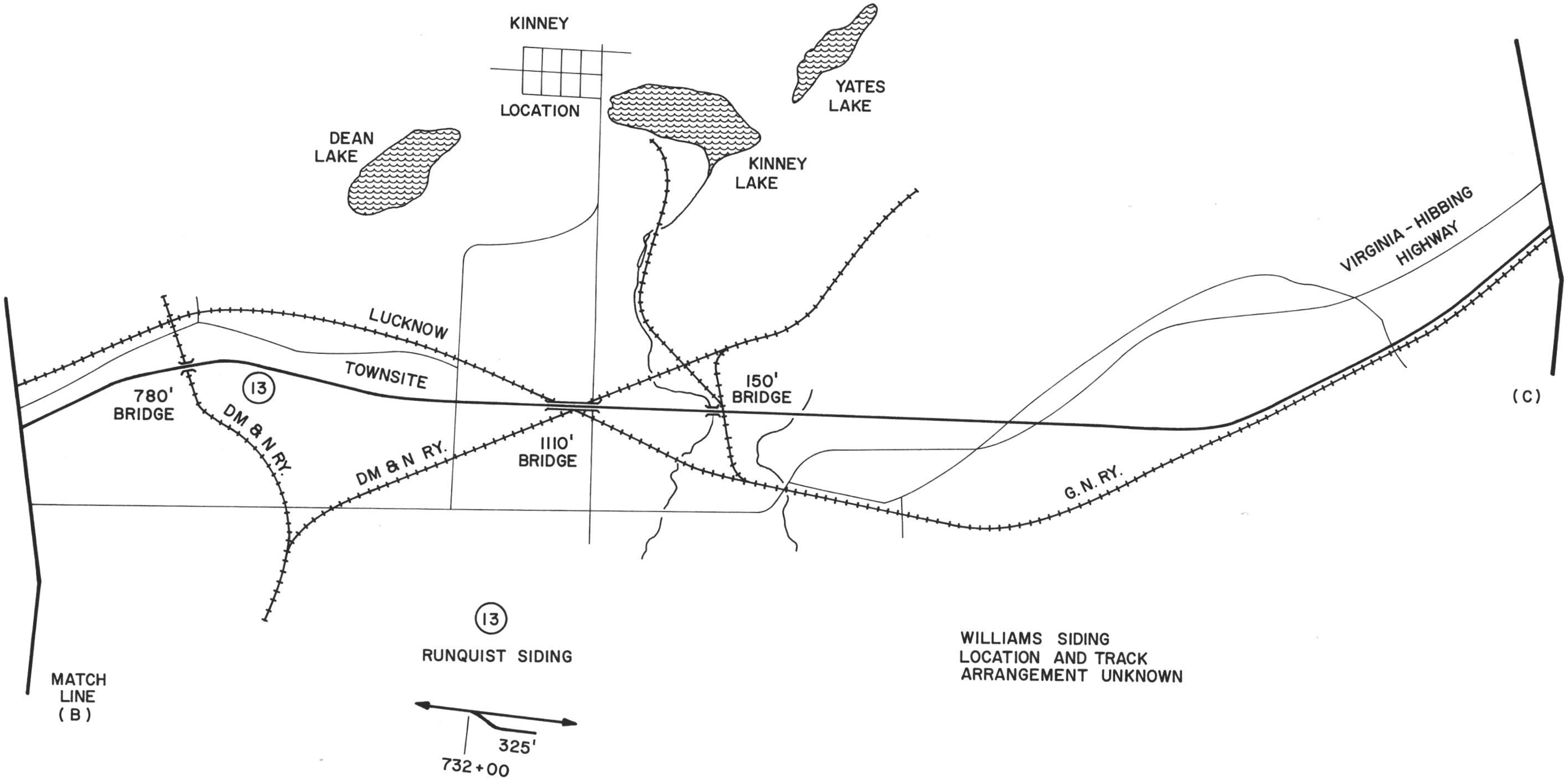
MESABA RAILWAY CO.
SHT. - 4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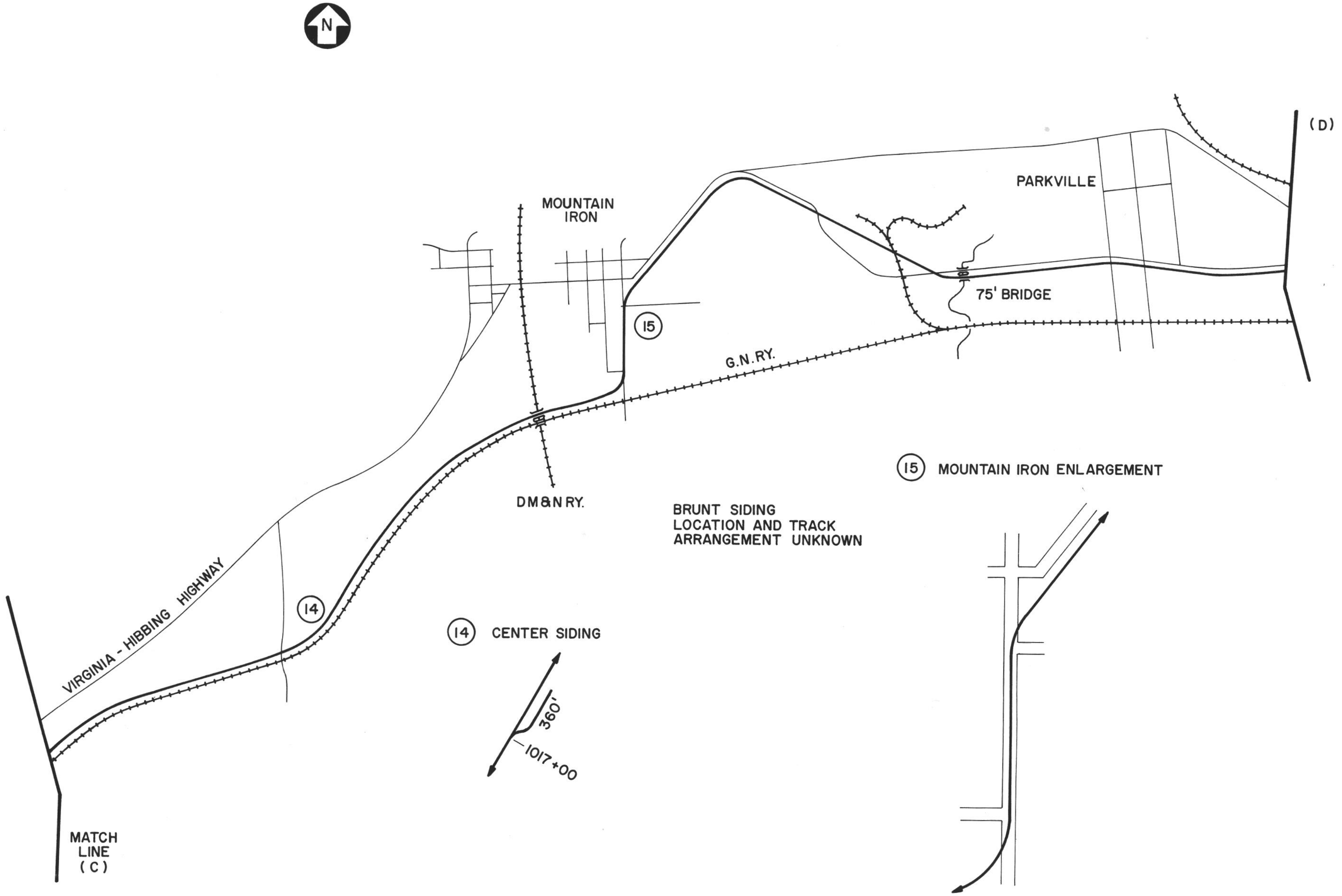
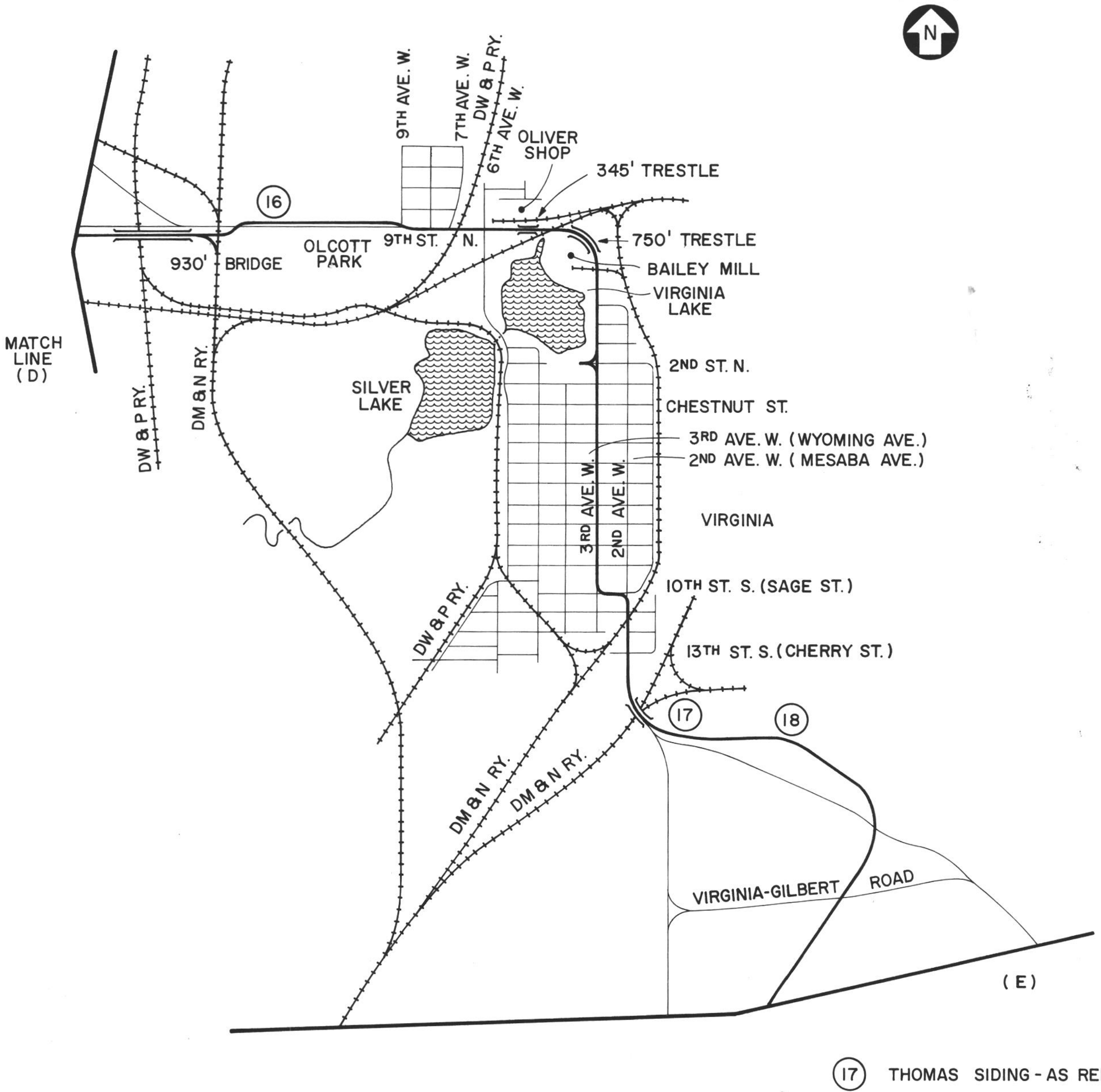
150'
BRIDGE
VIRGINIA - HIBBING
HIGHWAY
G. N. RY.
(C)
MATCH
LINE
(B)
⑬
RUNQUIST SIDING
325'
732 + 00
WILLIAMS SIDING
LOCATION AND TRACK
ARRANGEMENT UNKNOWN

PV119ED
AVERY™

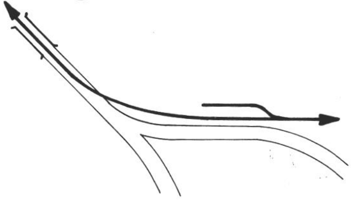
MESABA RAILWAY CO.
SHT.-5


N
MOUNTAIN IRON
PARKVILLE
(D)
75' BRIDGE
15
G.N.RY.
DM&N RY.
VIRGINIA - HIBBING HIGHWAY
14
MATCH LINE (C)
BRUNT SIDING LOCATION AND TRACK ARRANGEMENT UNKNOWN
15 MOUNTAIN IRON ENLARGEMENT
14 CENTER SIDING
360'
1017+00

MESABA RAILWAY CO.
SHT.-6

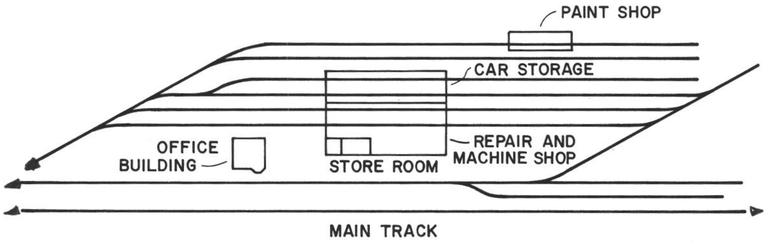

N
MATCH LINE (D)
(E)
⑯
930' BRIDGE
OLCOTT PARK
9TH ST. N.
9TH AVE. W.
7TH AVE. W.
DW & P RY.
6TH AVE. W.
OLIVER SHOP
345' TRESTLE
750' TRESTLE
BAILEY MILL
VIRGINIA LAKE
SILVER LAKE
2ND ST. N.
CHESTNUT ST.
3RD AVE. W. (WYOMING AVE.)
2ND AVE. W. (MESABA AVE.)
3RD AVE. W.
2ND AVE. W.
VIRGINIA
DW & P RY.
DM & N RY.
DW & P RY.
10TH ST. S. (SAGE ST.)
13TH ST. S. (CHERRY ST.)
⑰
⑱
DM & N RY.
DM & N RY.
VIRGINIA-GILBERT ROAD

⑰ THOMAS SIDING - AS RELOCATED

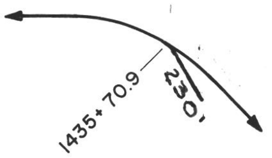


⑯ VIRGINIA CARHOUSE

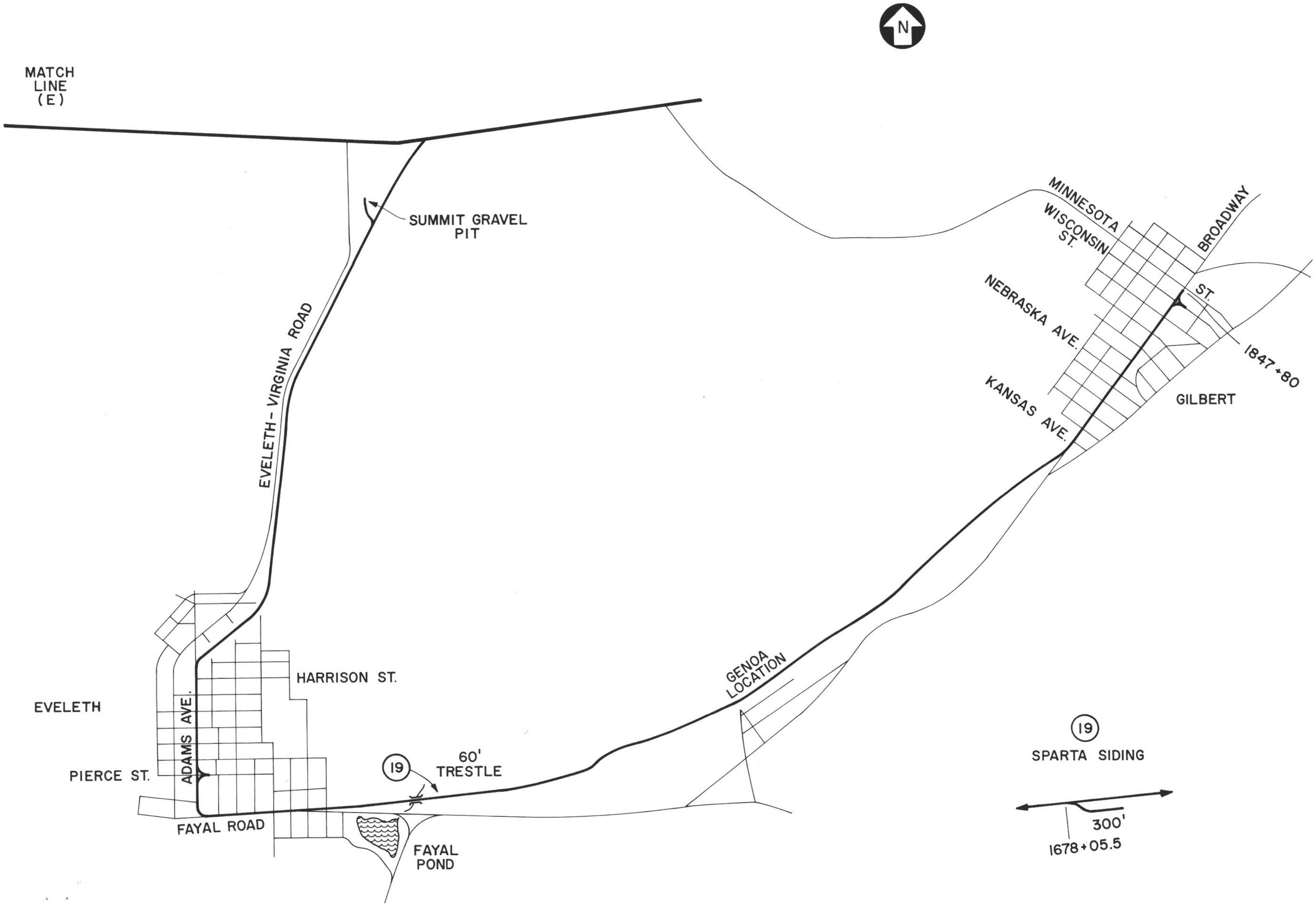
TRACK ARRANGEMENT PROPOSED AFTER ORIGINAL CARHOUSE WAS DESTROYED BY FIRE.

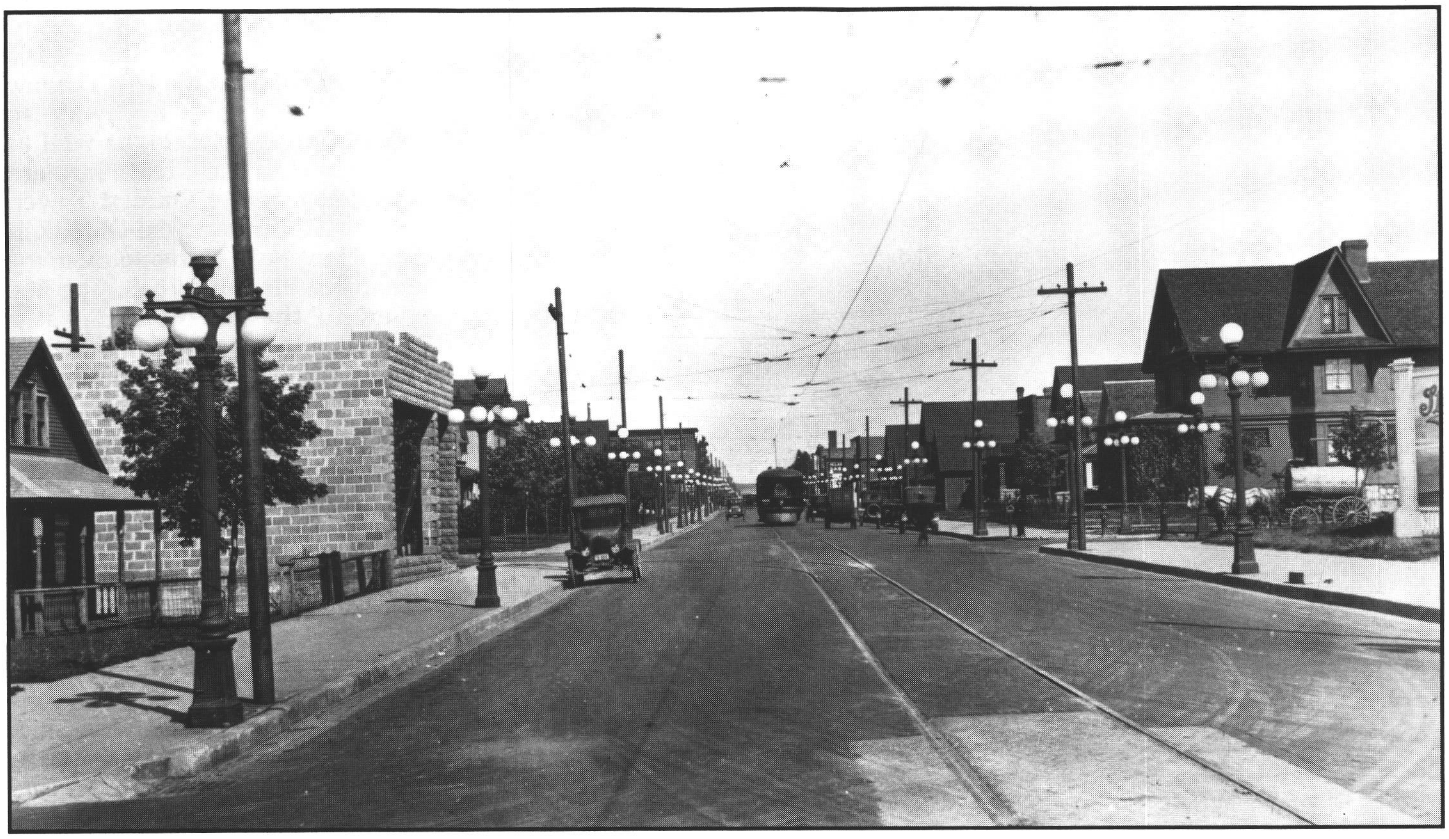

PAINT SHOP
CAR STORAGE
OFFICE BUILDING
STORE ROOM
REPAIR AND MACHINE SHOP
MAIN TRACK

⑱ THOMAS SIDING - ORIGINAL LOCATION

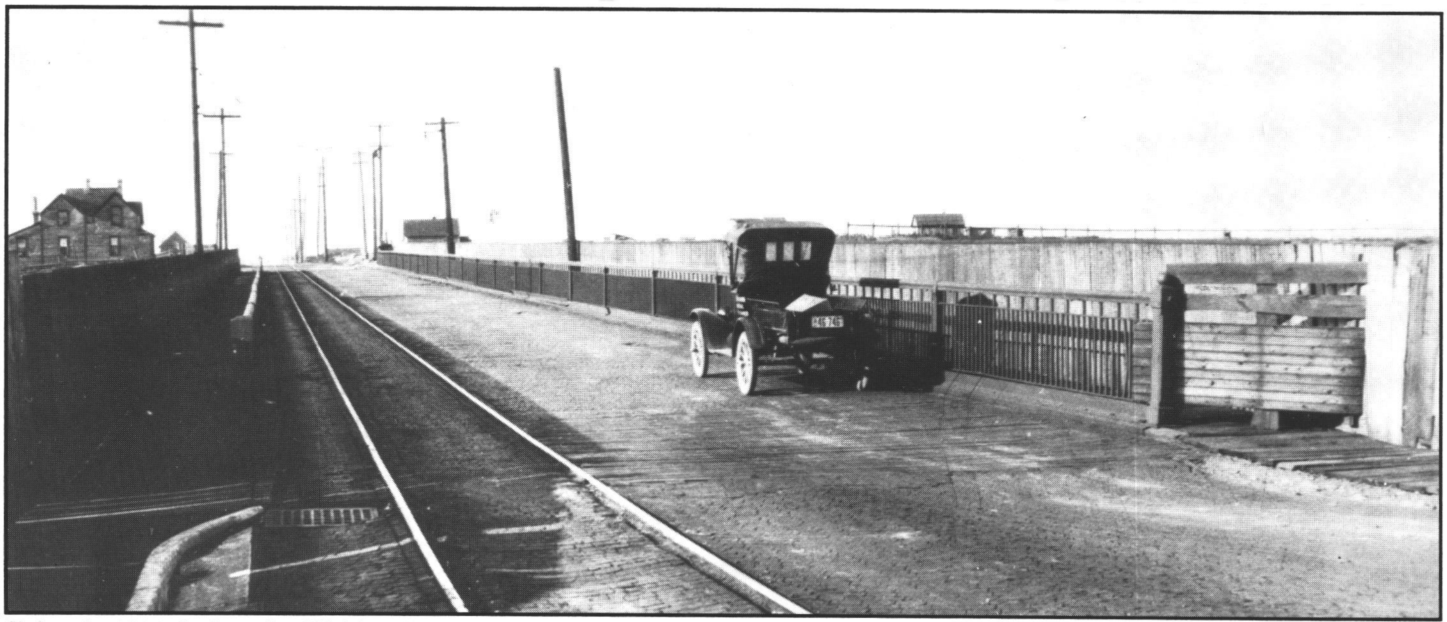

1435+70.9
230'

MESABA RAILWAY CO.
SHT. - 7

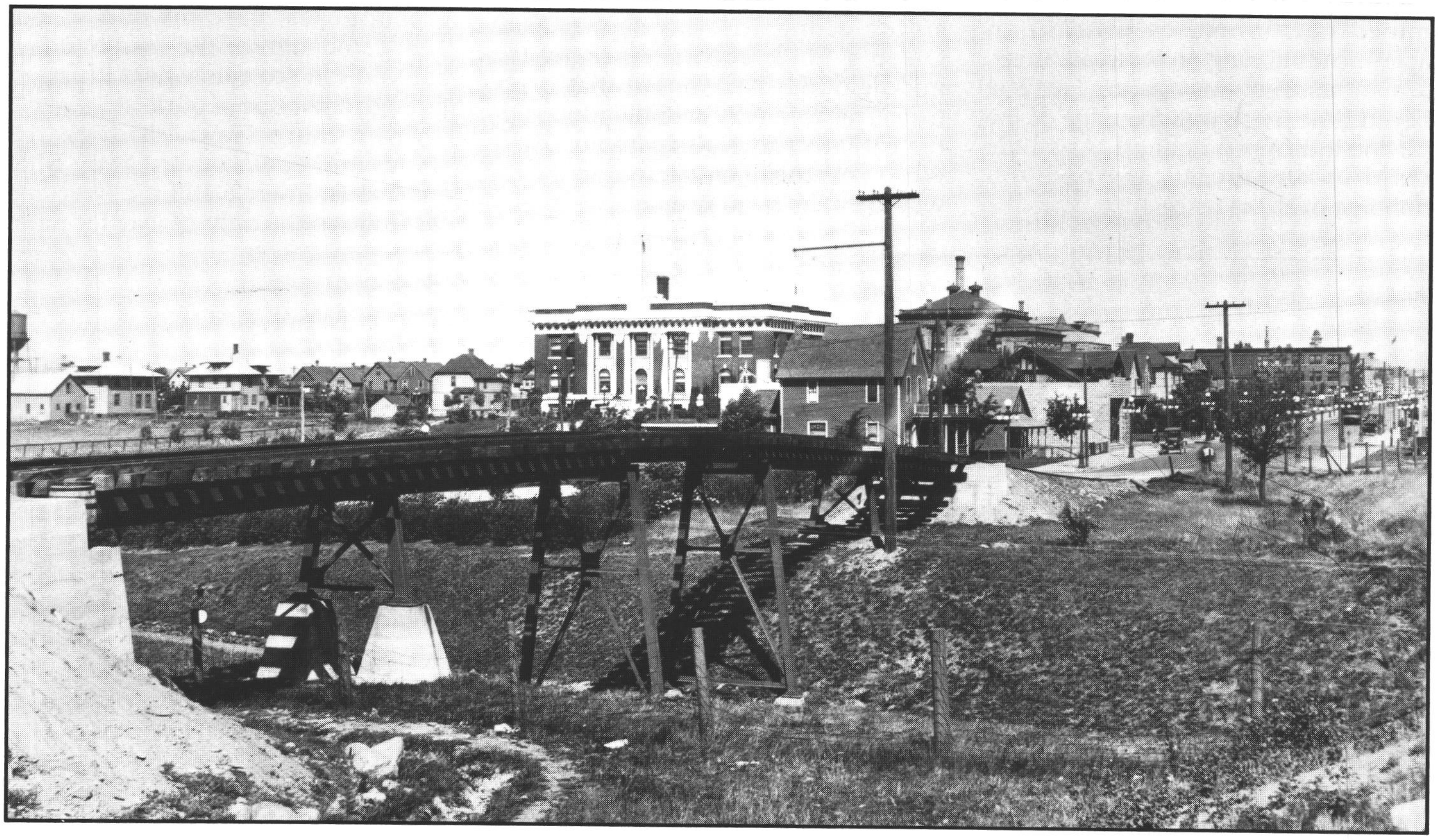

N
MATCH LINE (E)
SUMMIT GRAVEL PIT
EVELETH - VIRGINIA ROAD
MINNESOTA
WISCONSIN ST.
BROADWAY
ST.
NEBRASKA AVE.
1847+80
KANSAS AVE.
GILBERT
HARRISON ST.
EVELETH
ADAMS AVE.
PIERCE ST.
GENOA LOCATION
19
60' TRESTLE
FAYAL ROAD
FAYAL POND
19
SPARTA SIDING
300'
1678+05.5



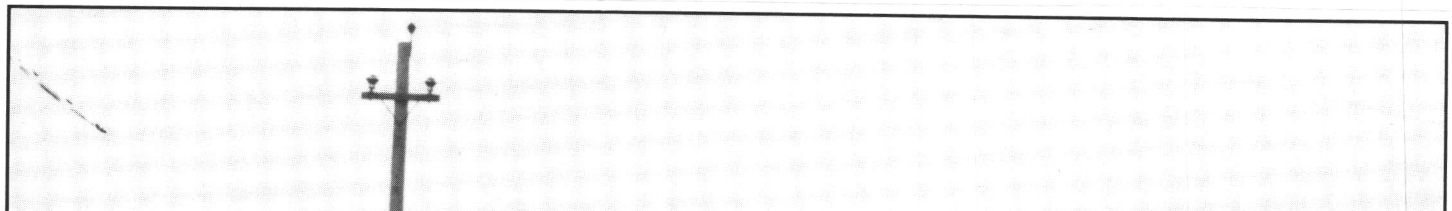
Looking north on 3rd Avenue at McKinley in 1920. The bridge over the DM&N shown below is behind the camera.



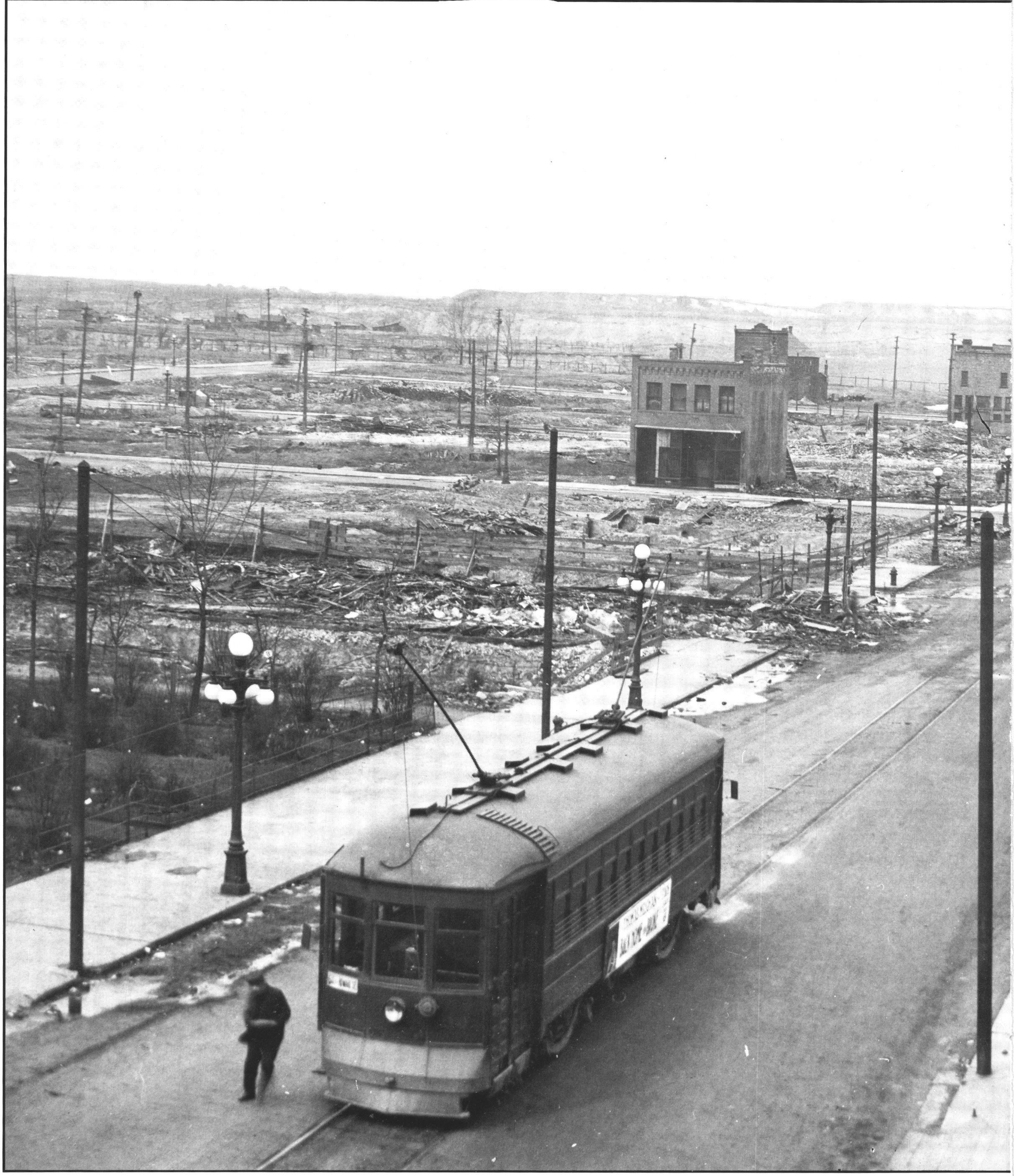
Taken in 1920, before the Hibbing line relocation, this bridge carried the interurban from North Hibbing across the Sellers Pit. Minnesota Historical Society collection.



This humpbacked trestle carried the Mesaba into North Hibbing, and served only local streetcars after the line change. An interurban is visible at right. Minnesota Historical Society collection.

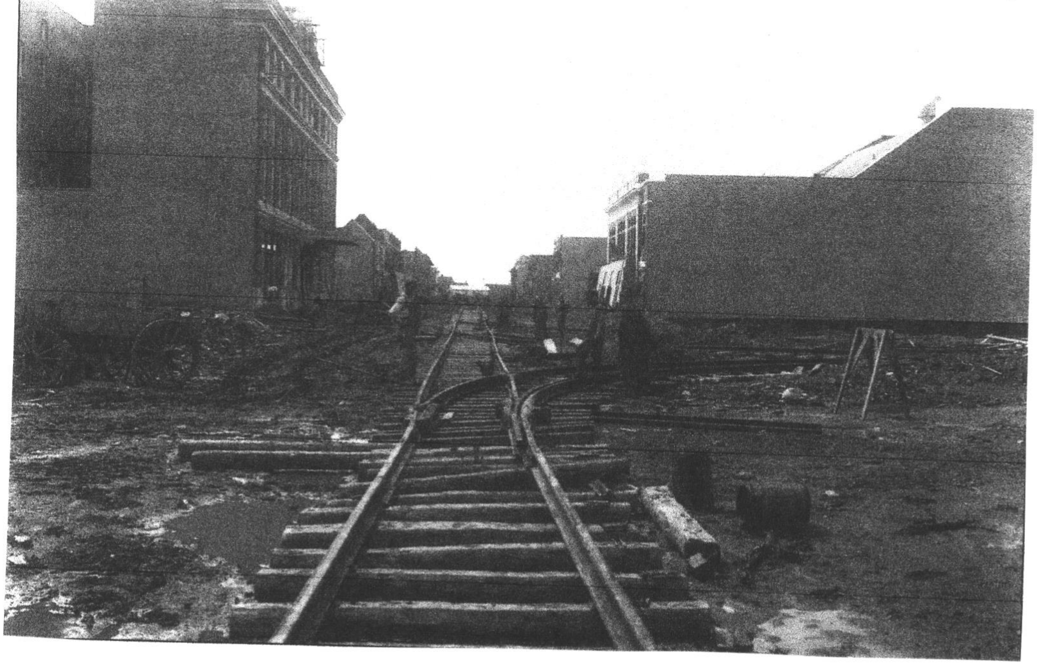


Above: The Fall 1992 Minnegazette ran an article on the Mesaba Ry. streetcar service in Hibbing. In this 1923 photo, one of the two local cars passes a building being moved from North to South Hibbing, to make room for the expanded iron ore pit. The location appears to be along N. 1st Street. Northeast Minnesota Historical Society collection.

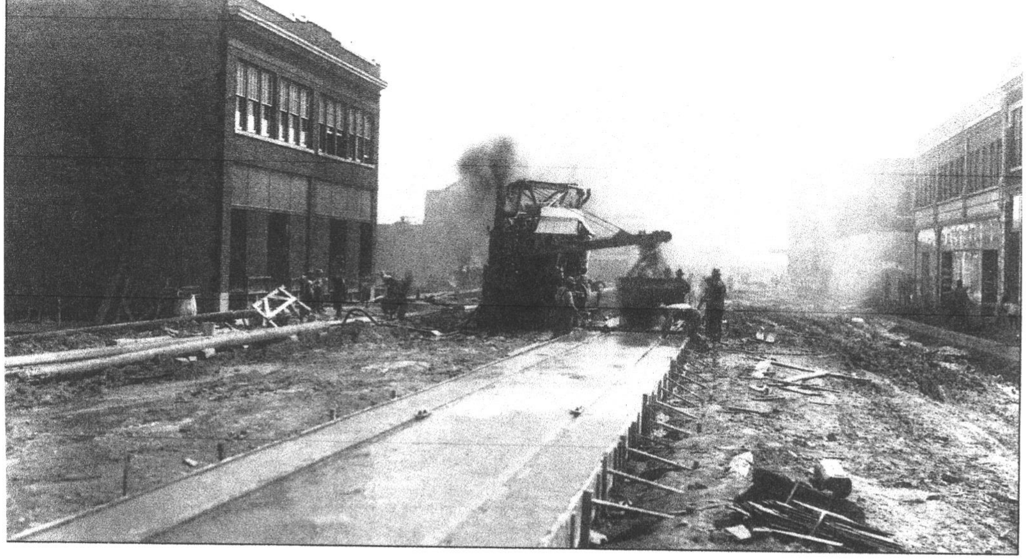


Little was left in North Hibbing by the time this picture was taken in 1925. The large building at right is the Oliver Hotel. The motorman is Helmer Stoner. He is changing poles for the trip back to South Hibbing. Dick Stoner collection.

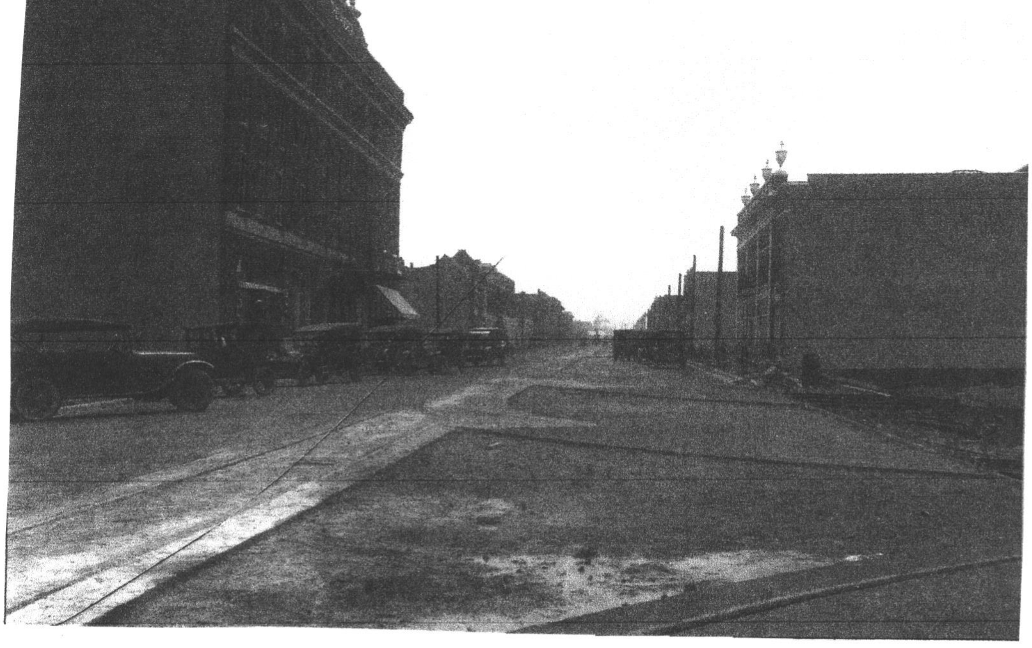
HOWARD ST. WEST FROM 6TH AVE E. MAY/JUNE 1921



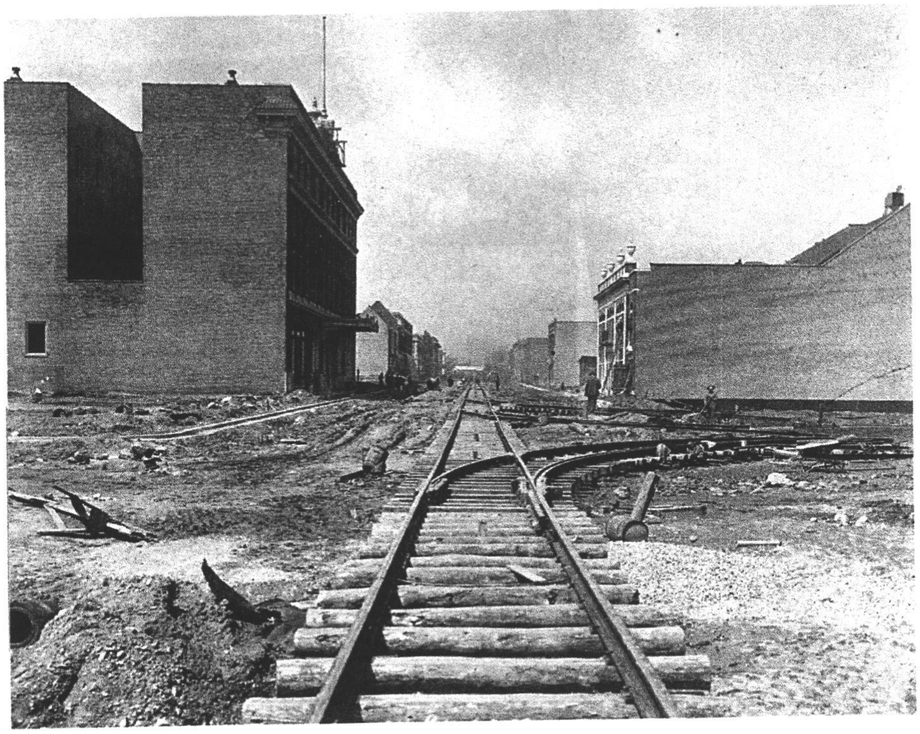
HOWARD ST EAST FROM 3RD AVE E 6-12-1921



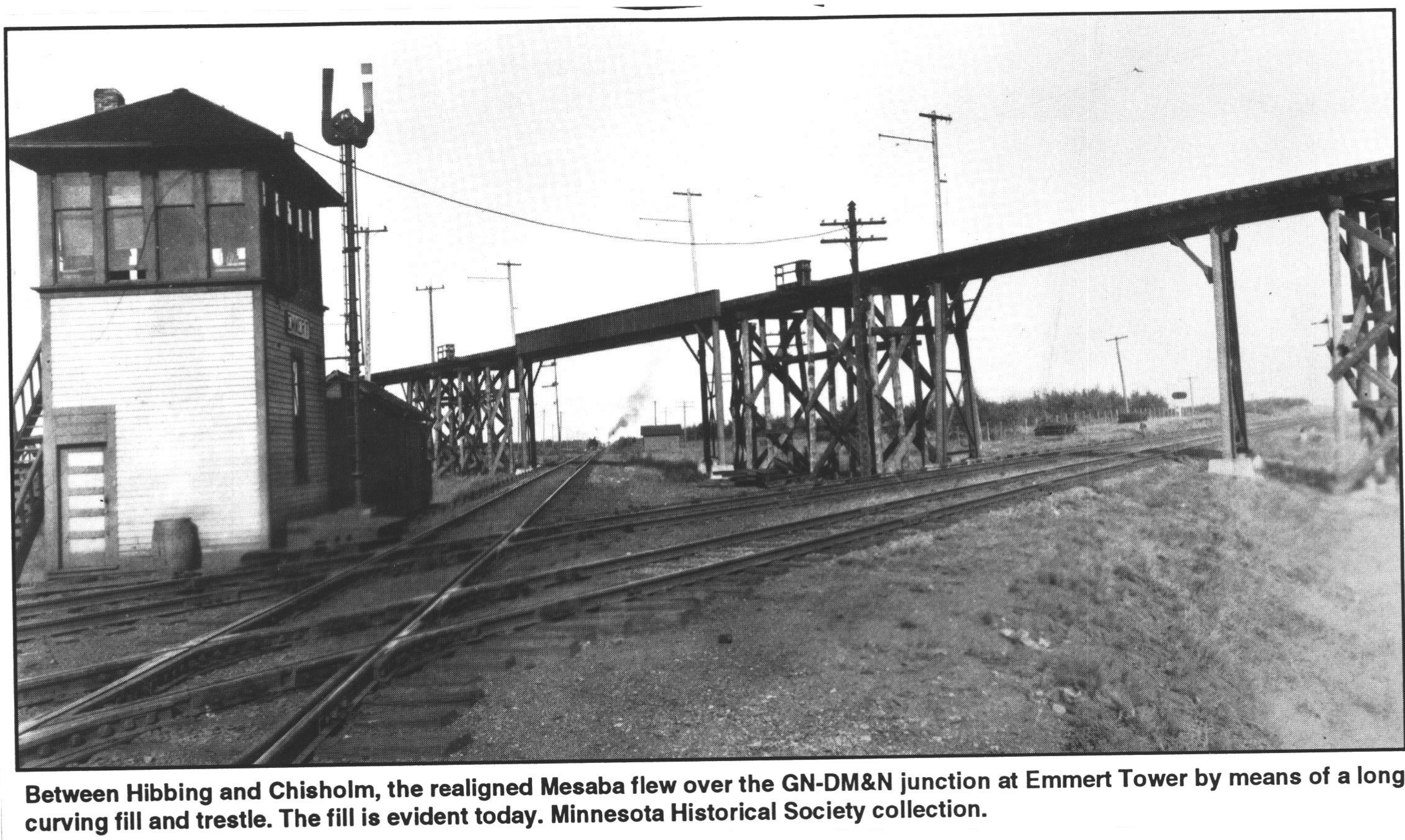
HOWARD ST. WEST FROM 6TH AVE. E 6-29-1921



AVERY® C
PV119ED

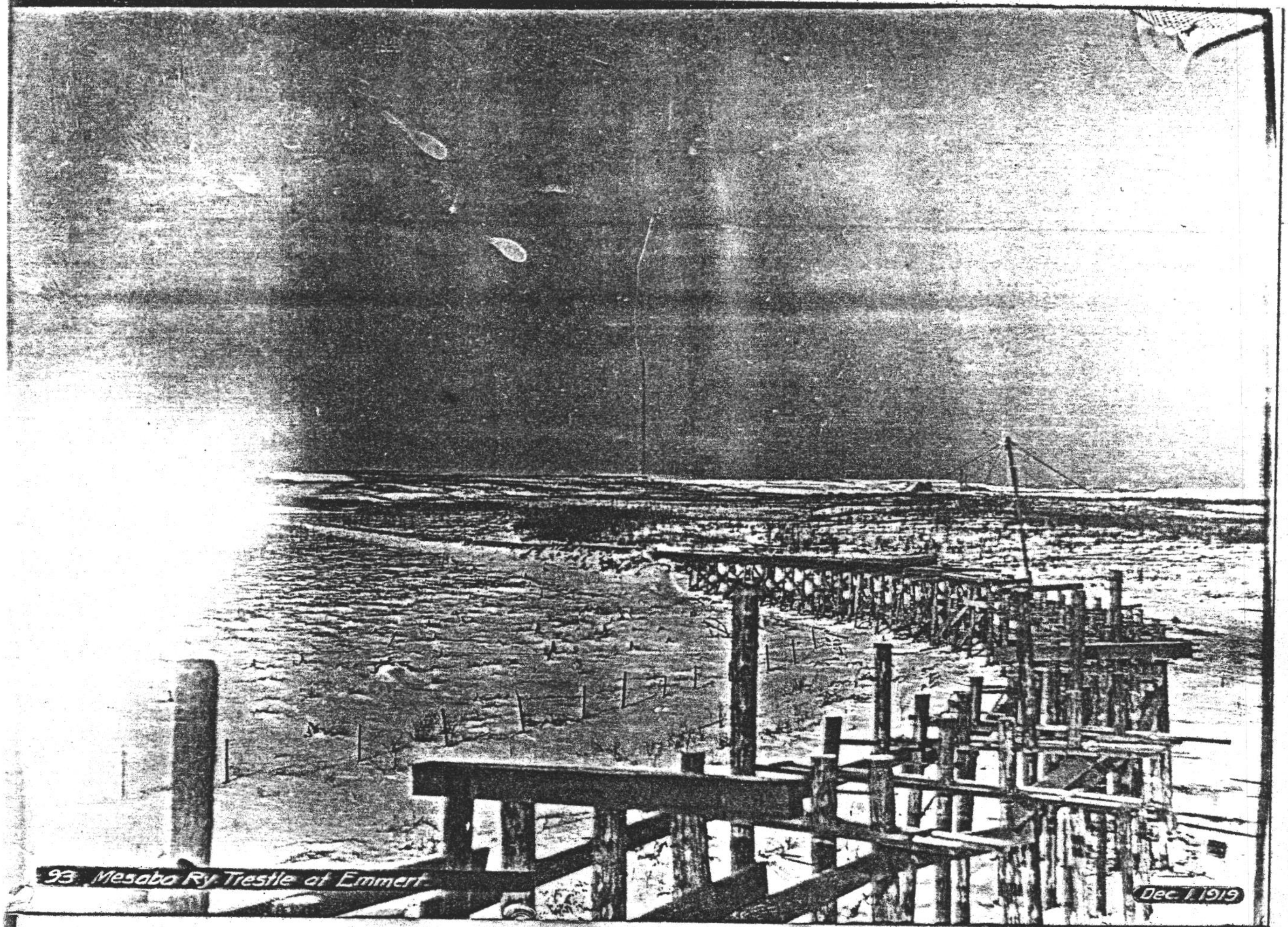


Looking west on Howard St. from 6th Ave., Hibbing, June 3, 1921. Construction on the carhouse-waiting station building, right, had not yet started. (Oliver Iron Mining Co.; Wayne C. Olsen collection)



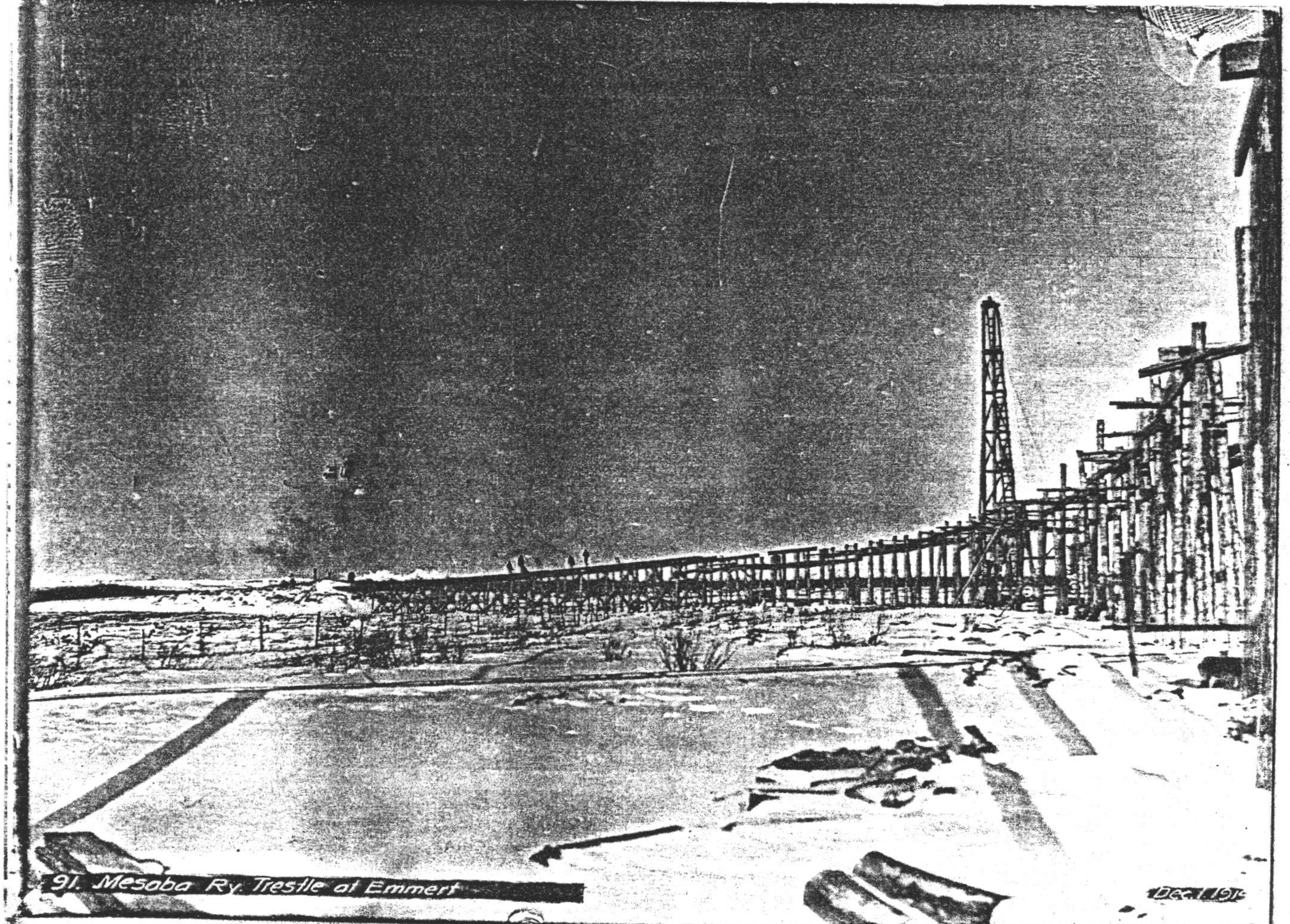
Between Hibbing and Chisholm, the realigned Mesaba flew over the GN-DM&N junction at Emmert Tower by means of a long curving fill and trestle. The fill is evident today. Minnesota Historical Society collection.

PV119ED AVERY™



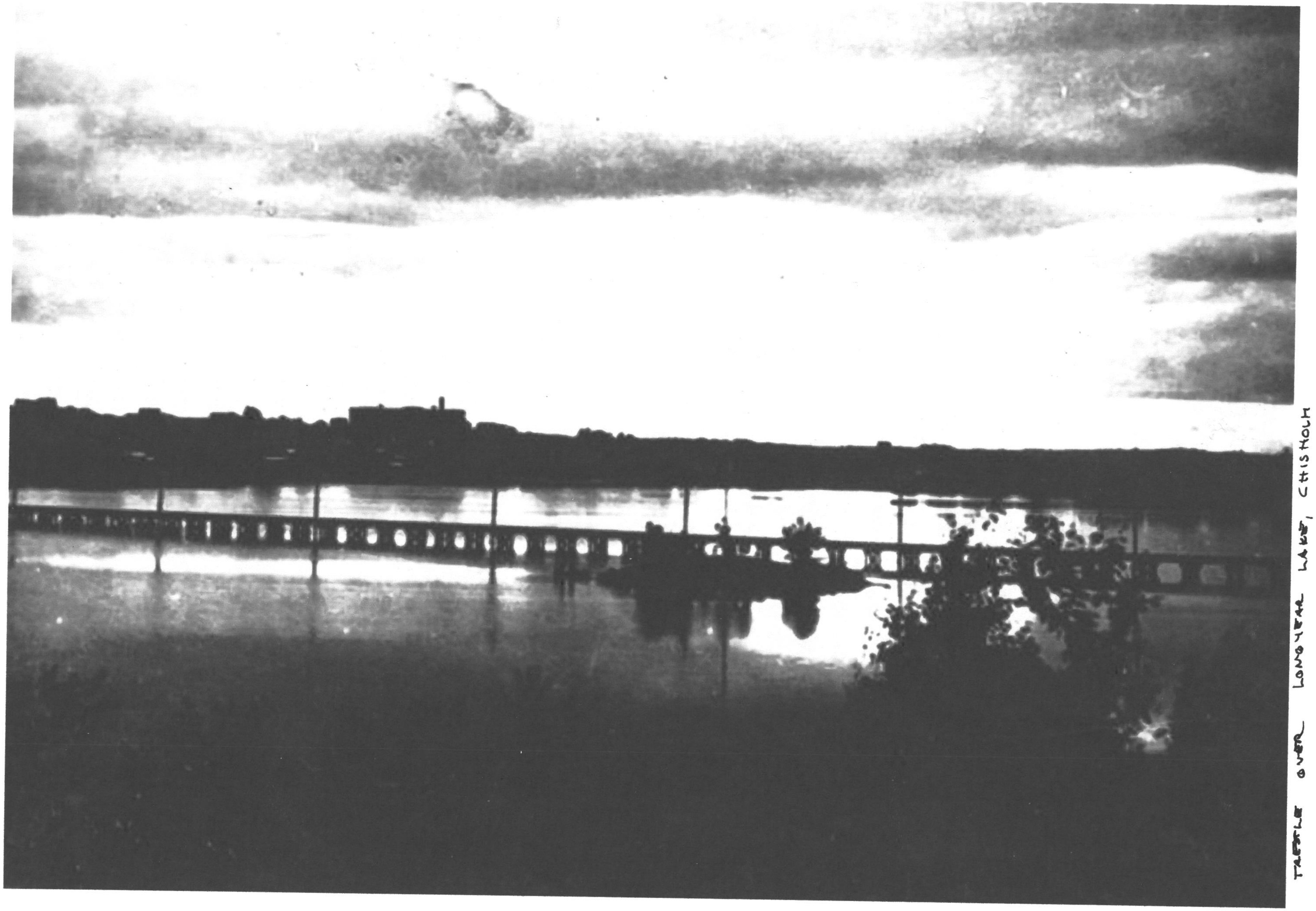
93. Mesaba Ry. Trestle at Emmert

Dec. 1. 1919



91. Mesaba Ry. Trestle at Emmert

Dec. 1. 1919



TRESTLE OVER LONGYEAR LAKE, CHISHOLM

POWER GENERATION AND DISTRIBUTION

Power Station

The power station was located on the property of the Virginia & Rainy Lake Lumber Co. about ¼ mile from the main track where it entered the city of Virginia. Because of the high cost of coal it was decided to use the waste and refuse from the lumber mill for fuel. Water was obtained from a nearby lake. A belt conveyor from the lumber mill fed directly into the firing room of the power station. The building measured 120'6" x 58'9" and was divided into two sections: a boiler room 67'0" x 37'6" and a turbine room 53'6" x 58'9". Construction was of steel with a brick and concrete super-structure erected upon a concrete foundation supported by piling.

Three 300 h.p. Edge-Moor horizontal water-tube boilers each had four fuel chutes and firing doors. They were designed for 175 lbs. per sq. in. steam pressure developing 450 h.p. each. The boilers were served by three 150' high guyed steel stacks 4'6" in diameter. Generating equipment consisted of two 750 KW, 600 volt, 3 phase, 60 cycle, horizontal condensing turbines. For regular service excitation was obtained from a 75 h.p., 600 volt, 3 phase induction motor direct-connected to a 60 KW, 125 volt, compound wound exciter. Designed to run in parallel with the former, for use when the plant was shut down, was a self-contained unit consisting of a 35 KW, 125 volt, non-condensing turbine exciter.

The line was originally intended for 1200 volts D.C. operation but before actual construction began it was decided to design the motor-generator sets for 750 volts D.C. and to operate at 600 volts D.C. Shortly after operation started traffic was much heavier than anticipated and it was discovered that the distribution system was barely sufficient to handle the peak traffic. It was then decided to make full use of the designed equipment and the voltage was raised to 750.

Transmission Line

A transmission frequency of 22,000 volts, 60 cycle A.C. was selected because the company planned to enter into the power and lighting business as well. As of January 1914 it had contracts with three cities and was in the process of negotiating several others. This voltage was also used by the power plant of the Virginia & Rainy Lake Lumber Co.; a 3 phase line was built between the two switchboards so that each station could synchronize with the other in case of interruption. In addition the main steam headers of each station were connected. A transmission line consisting of three #2 copper wires connected the power station with the substation at Chisholm.

By 1918 the power station had been leased to the Great Northern Power Co. and the Alternating Current purchased from them. The GNP Co. was later sold to the Minnesota Power & Light Co.

Substations

Two substations were used to operate the line.

A portion of the turbine room in the power station was used for a substation and contained two General Electric 300 KW synchronous motor-generator sets served by three 250 KVA water-cooled transformers.

A waiting station-substation was constructed 20 miles west at Chisholm, the substation being operated in conjunction with the passenger and freight station, a single agent handling all the functions. The building measured 47'6" x 27'6" and was constructed of concrete foundation, steel frame, brick walls and 4" concrete slab roof covered with asphalt-gravel roofing. The A.C.

transmission line passed thru choke coils and disconnect switches, and connected by way of oil switches to 200 KVA self-cooled transformers. Two General Electric 300KW motor-generator sets converted the A.C. to 750 volts D.C.

Feeders

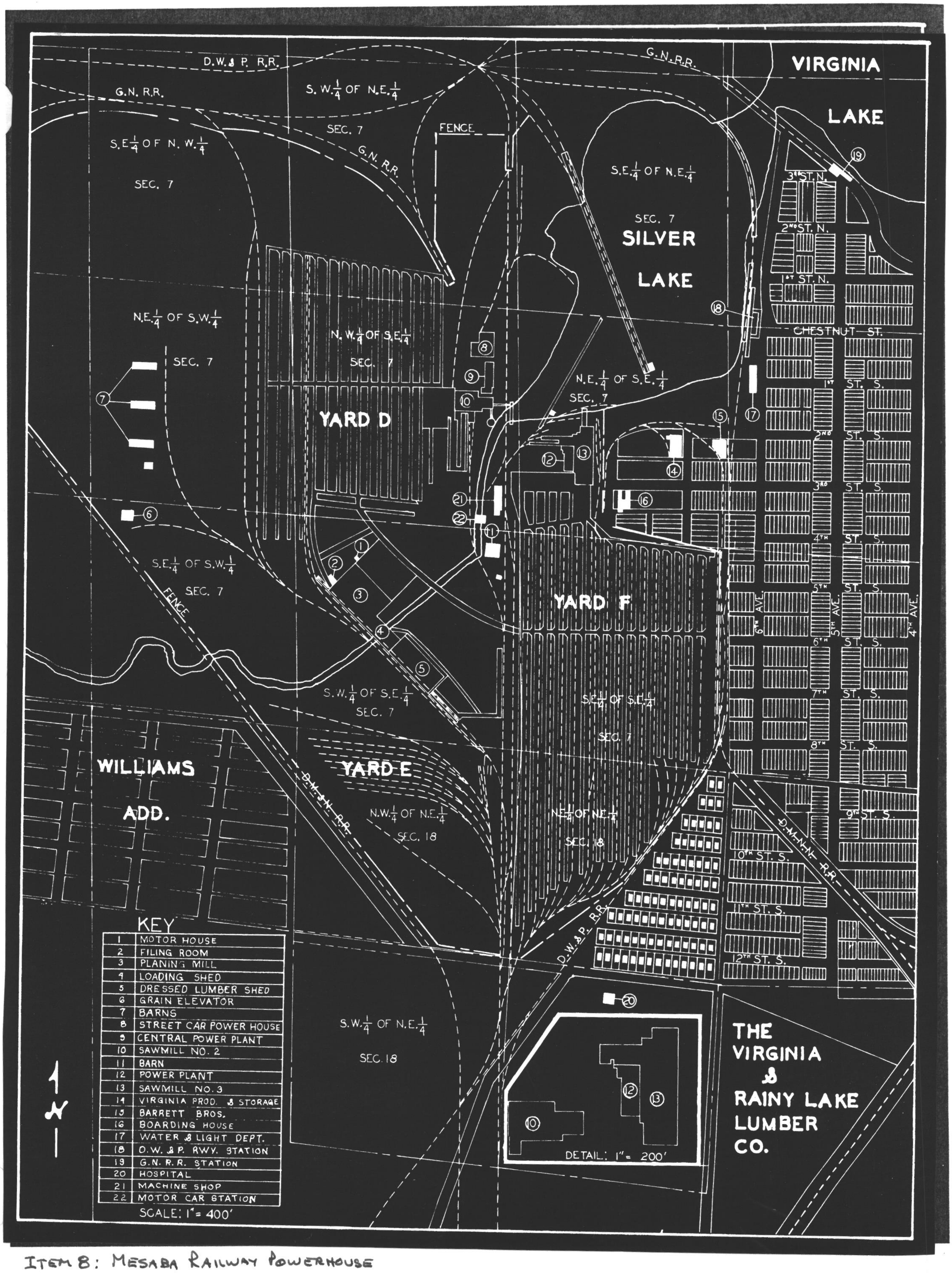
Two 400,000 circular-mil D.C. feeders extended in both directions from the Virginia substation: one to the Chisholm substation and the other to Gilbert. One 300,000 circular-mil feeder was installed from the Chisholm substation to Hibbing.

Hibbing-Chisholm Line Relocation

Part of the new Hibbing Waiting Station and Carhouse building was set aside for substation purposes. The substation equipment consisted of two motor-generator sets with automatic controls.

The feeder system was also re-arranged for it was reported that 250,000 circular-mil feeders were employed.

Looking west toward the Oliver Shop, Virginia, from the 750 ft. timber trestle at the Bailey Mill. (Wayne C. Olsen collection)


VIRGINIA
LAKE
D.W.& P. R.R.
G.N.R.R.
G.N. R.R.
S.W.$\frac{1}{4}$ OF N.E.$\frac{1}{4}$
SEC. 7
S.E.$\frac{1}{4}$ OF N.W.$\frac{1}{4}$
SEC. 7
G.N. R.R.
FENCE
S.E.$\frac{1}{4}$ OF N.E.$\frac{1}{4}$
SEC. 7
SILVER
LAKE
3RD ST. N.
2ND ST. N.
1ST ST. N.
CHESTNUT ST.
N.E.$\frac{1}{4}$ OF S.W.$\frac{1}{4}$
SEC. 7
N.W.$\frac{1}{4}$ OF S.E.$\frac{1}{4}$
SEC. 7
N.E.$\frac{1}{4}$ OF S.E.$\frac{1}{4}$
SEC. 7
YARD D
1ST ST. S.
2ND ST. S.
3RD ST. S.
4TH ST. S.
5TH ST. S.
6TH ST. S.
7TH ST. S.
8TH ST. S.
9TH ST. S.
10TH ST. S.
11TH ST. S.
12TH ST. S.
6TH AVE.
5TH AVE.
4TH AVE.
S.E.$\frac{1}{4}$ OF S.W.$\frac{1}{4}$
SEC. 7
FENCE
YARD F
S.W.$\frac{1}{4}$ OF S.E.$\frac{1}{4}$
SEC. 7
S.E.$\frac{1}{4}$ OF S.E.$\frac{1}{4}$
SEC. 7
WILLIAMS
ADD.
YARD E
D.W.& N. R.R.
N.W.$\frac{1}{4}$ OF N.E.$\frac{1}{4}$
SEC. 18
N.E.$\frac{1}{4}$ OF N.E.$\frac{1}{4}$
SEC. 18
D.M.& N. R.R.
D.W.& P. R.R.
S.W.$\frac{1}{4}$ OF N.E.$\frac{1}{4}$
SEC. 18
DETAIL: 1" = 200'
N
THE
VIRGINIA
&
RAINY LAKE
LUMBER
CO.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

KEY

1	MOTOR HOUSE
2	FILING ROOM
3	PLANING MILL
4	LOADING SHED
5	DRESSED LUMBER SHED
6	GRAIN ELEVATOR
7	BARNS
8	STREET CAR POWER HOUSE
9	CENTRAL POWER PLANT
10	SAWMILL NO. 2
11	BARN
12	POWER PLANT
13	SAWMILL NO. 3
14	VIRGINIA PROD. & STORAGE
15	BARRETT BROS.
16	BOARDING HOUSE
17	WATER & LIGHT DEPT.
18	D.W. & P. RWY. STATION
19	G.N. R.R. STATION
20	HOSPITAL
21	MACHINE SHOP
22	MOTOR CAR STATION

SCALE: 1" = 400'

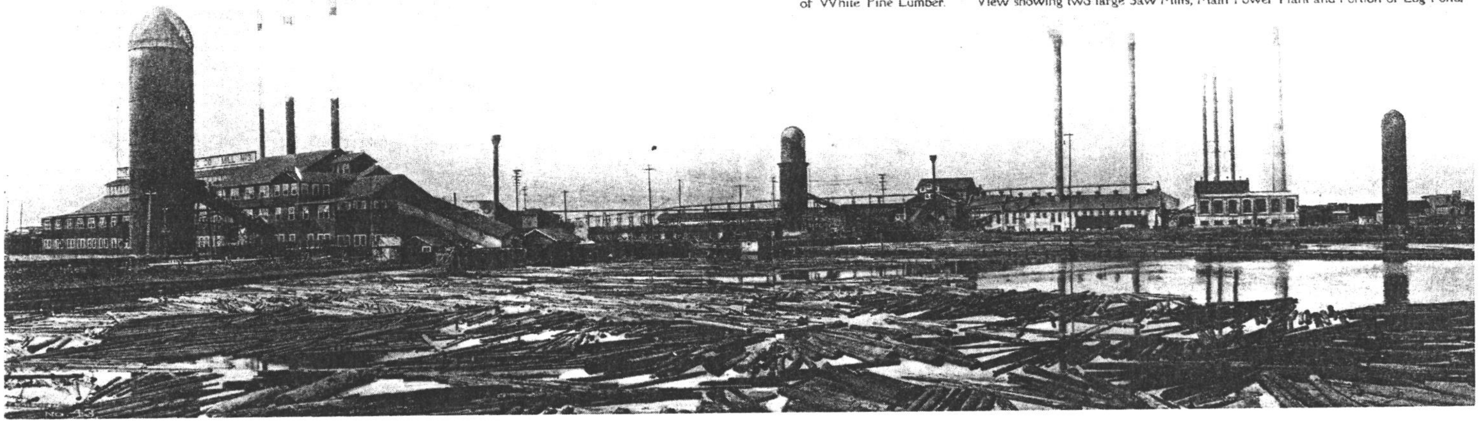
ITEM 8: MESABA RAILWAY POWERHOUSE

KENTUCKY
VIRGIN

MESABA RAILWAY POWERHOUSE

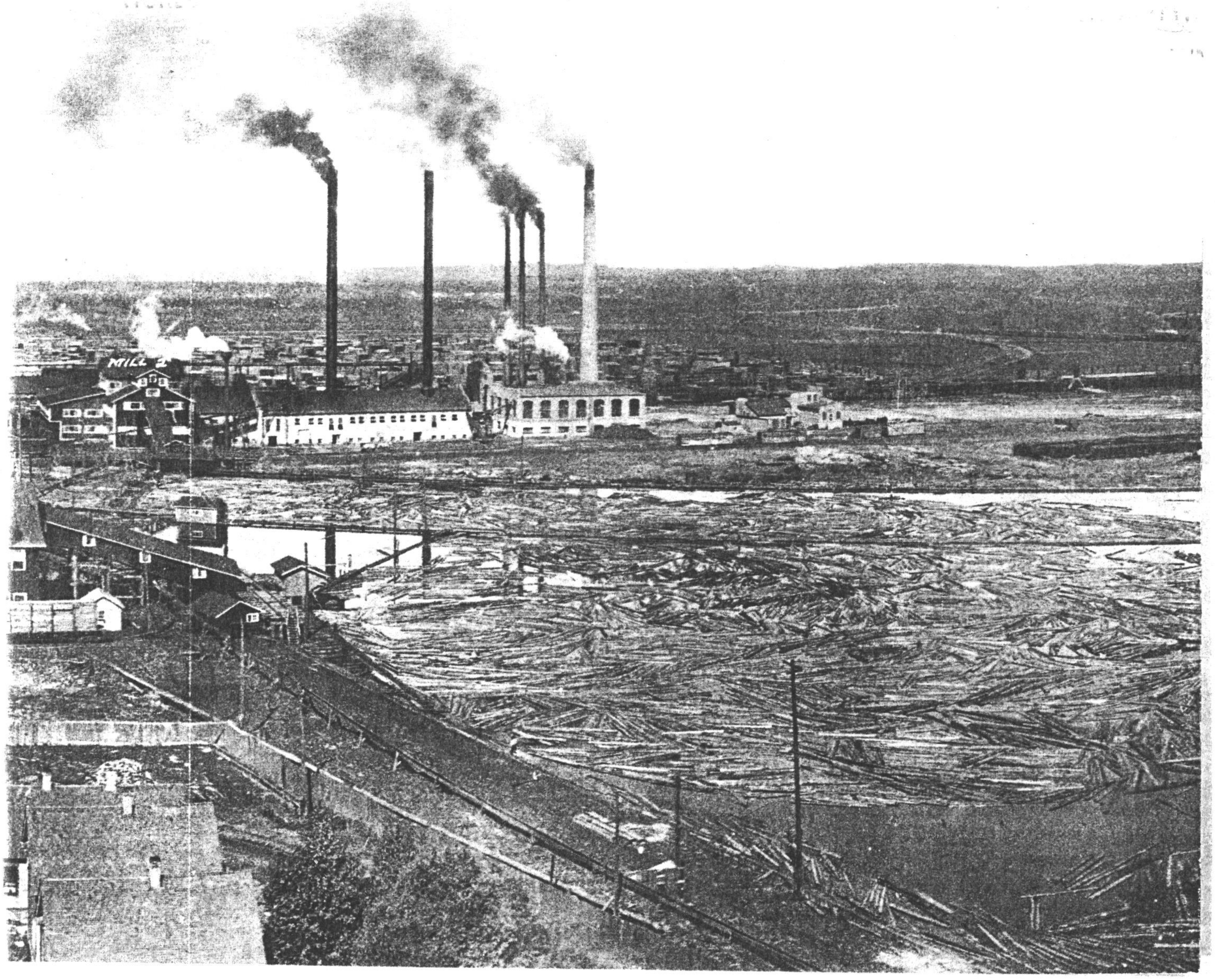
↓

The Virginia & Rainy Lake Co. Virginia, Minnesota. The World's Largest Manufacturers of White Pine Lumber. View showing two large Saw Mills, Main Power Plant and Portion of Log Pond.



MESABA RAILWAY POWERHOUSE

↓



FACILITIES

VIRGINIA CARHOUSE AND OFFICE

The office building and carhouse were constructed in Virginia adjacent to the main track on a strip of property 200 ft. wide.

The carhouse building was 86'2" wide and 122'2" long, constructed of concrete foundation, steel frame and brick walls with a wood roof. Four tracks with a capacity of two cars each ran through the building, two of them with a repair pit 56 ft. long situated at one end opposite the repair shop space. The repair shop and storeroom occupied a 20 ft. aisle on one side of the carhouse enclosed with brick partitions. All track entrances were provided with rolling steel doors. A two-story office building measuring 34'10" x 36'0" adjoined the carhouse building, containing the general and operating offices of the company.

On 11-26-1913 the hot-water heater of a passenger motor car inside the carhouse exploded. The resulting fire completely destroyed the carhouse building, adjoining office building, and seven pieces of equipment. A temporary frame structure was erected over the two pit tracks inside the burned-out shell of the carhouse for servicing and maintaining the equipment until construction of the new building was nearly completed in the summer of 1914.

The new office and carhouse buildings were similar in size and design to the original buildings with two exceptions. A flat concrete roof was placed on the carhouse, and the office building was physically separate from the carhouse.

A paint shop building was constructed during the summer of 1914. Measuring 20'0" x 62'0" it was constructed of concrete foundation, steel frame and brick walls. One track ran thru the building with a rolling steel door at each end.

Details-New Virginia Office Building

This was a two-story structure measuring 34'10" x 36'0¼". The first floor contained the superintendent's office, dispatcher's office, trainmen's room and battery room. The second floor contained the manager's office, auditor's office and stenographer's office.

Details-New Virginia Carhouse

This building measured 86'2" wide by 122'2" long. Tracks 1 and 2 contained inspection pits on the west end and repair pits on the east end. The hydraulic car lift was located in the repair pit on track 2. Tracks 3 and 4 were for car storage only, being separated from tracks 1 and 2 by a brick wall.

The oil room (for lubricating and signal oil) was 18'5" x 16'0" and the storeroom 18'5" x 30'0". The boiler room was located underneath these two rooms, 18'6" x 46'0", and contained one 50 h.p. Ordway Eclipse return fire-tube stationary boiler for heating.

The machine shop area measured 25' x 75' comprising the master mechanic's office 10' x 14' and the machine shop itself 18'6" x 62'0". One General Electric 25 h.p. 440 volt induction motor powered the shop equipment line shaft.

Shop Machinery

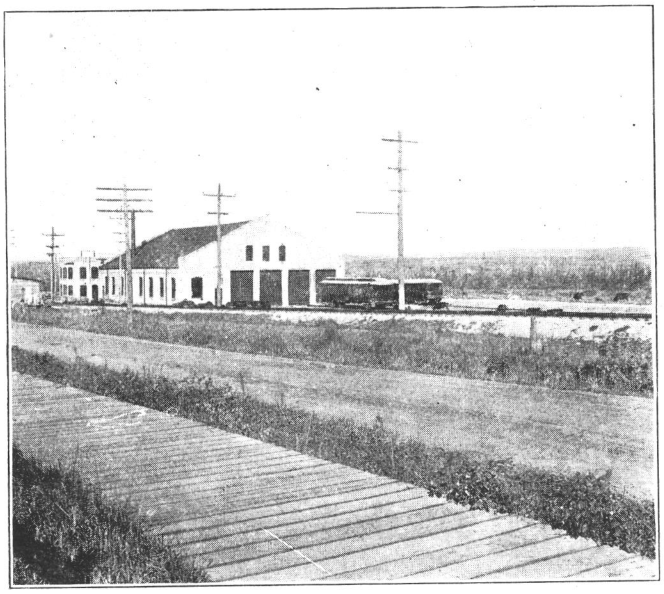
- One Westinghouse air compressor.
- One Carbic welding and cutting torch.
- One Canton floor crane.
- One hydraulic pit jack.
- Two 8-ton Yale & Towne chain hoists for lifting carbodies.
- One chain hoist for transferring wheels from press to lathe.
- One wheel transfer truck.
- One armature baking oven.
- One Buffalo #3 forge and exhaust fan.
- One woodworking lathe.
- One Crescent 1016 wood planer.
- One Crescent 26" band saw.
- One Crescent circular saw and table.
- One Hannan & Finton 21" swing 9' lathe.
- One Seyferts & Sons 40" lathe.
- One 300-ton hydraulic wheel press.
- One J. E. Snyder drill press.
- One William Sellers steel planer.
- One Marvel #2 draw cut saw (power hack saw).
- One 12" emery wheel and stand.
- One whetstone (grindstone).

HIBBING WAITING STATION AND CARHOUSE

A terminal building was constructed at 6th Ave. and Howard St. during 1921 containing a ticket office-waiting room, freight house, carhouse and substation. This building was constructed of concrete foundation, steel frame, brick walls and 4" concrete roof. The carhouse portion contained two tracks, each with a pit of sufficient length to service a 49 ft. long car; steel rolling doors were installed at each track entrance.

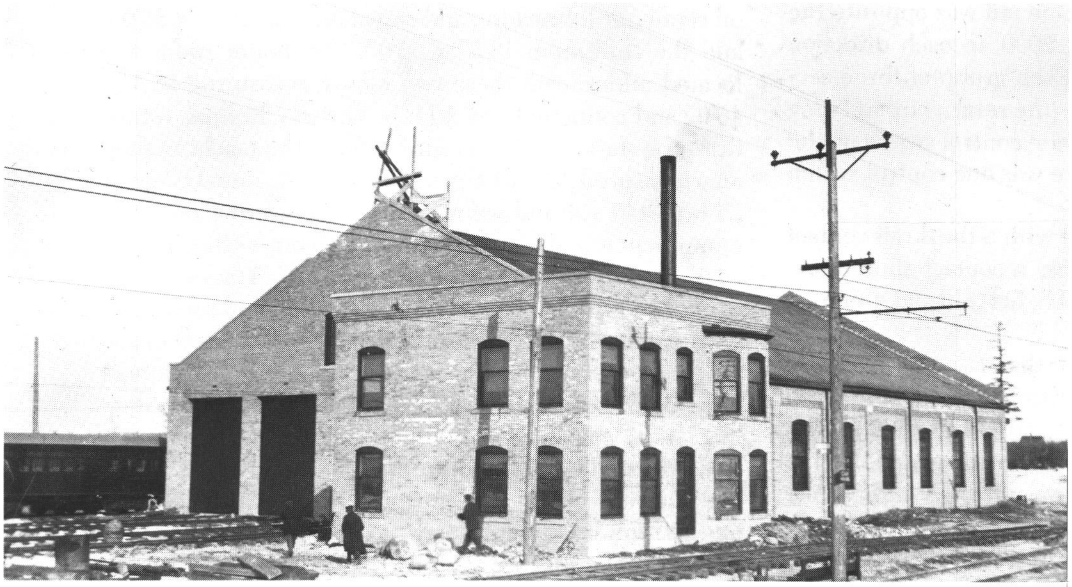
Details

The length of the ticket office, waiting room and freight house was 69'0½". The interior areas were: ticket office 14'4" x 8'4½", waiting room 22'3" x 21'3", two toilets in the waiting room 4'2" x 7'2" each, and freight warehouse 24'7½" x 21'6". The loading platform was 8'2" wide and 50'6" long; a canopy over the platform extended the full length of the building, measuring 8'2" x 69'0½". The width of the waiting room and carhouse was 61'2" and the length of the carhouse and substation was 85'2". The carhouse itself was 35'8" wide by 60'0" long and the substation was 25'0" x 22'10"

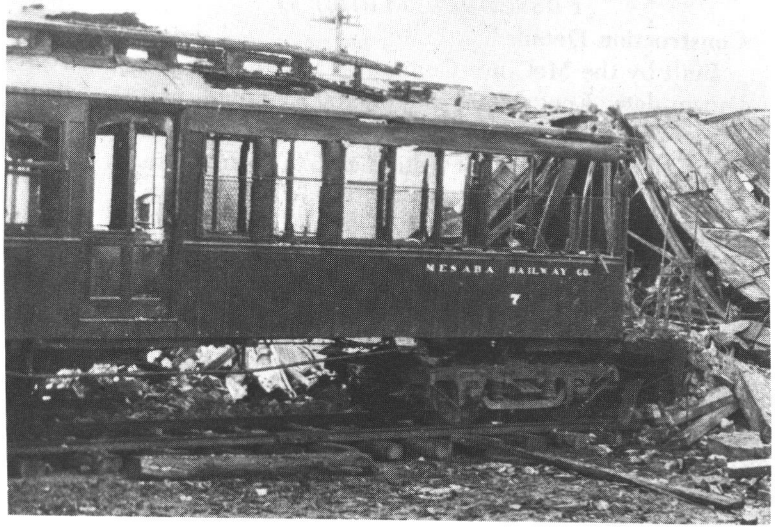


Mesaba Railway—General View of Carhouse and Shops Before Destruction by Fire

PV119ED AVERY™

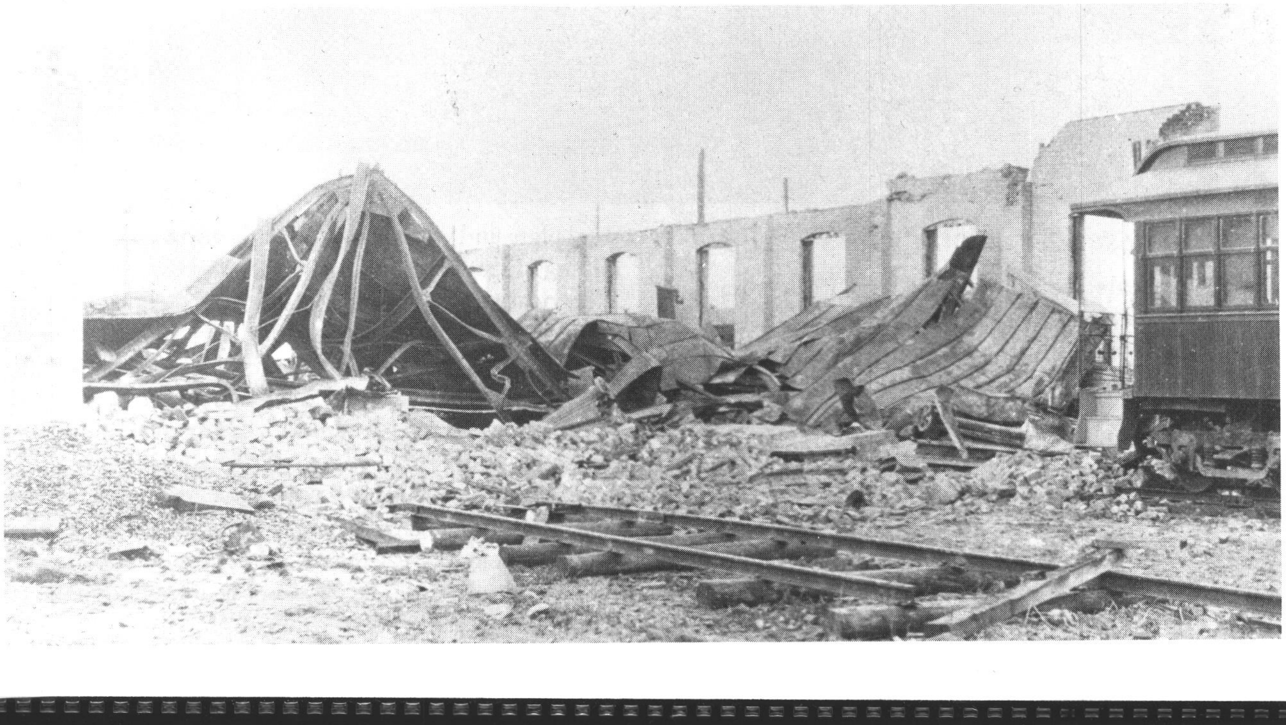


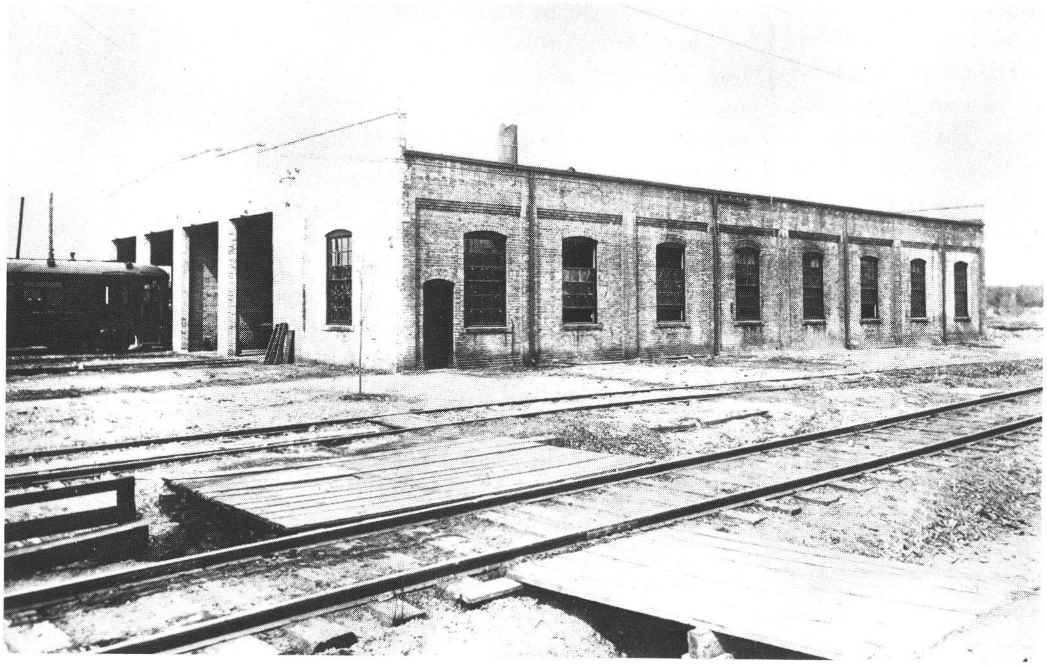
The original carhouse and office buildings at Virginia nearing completion in February, 1913. (Wayne C. Olsen collection)



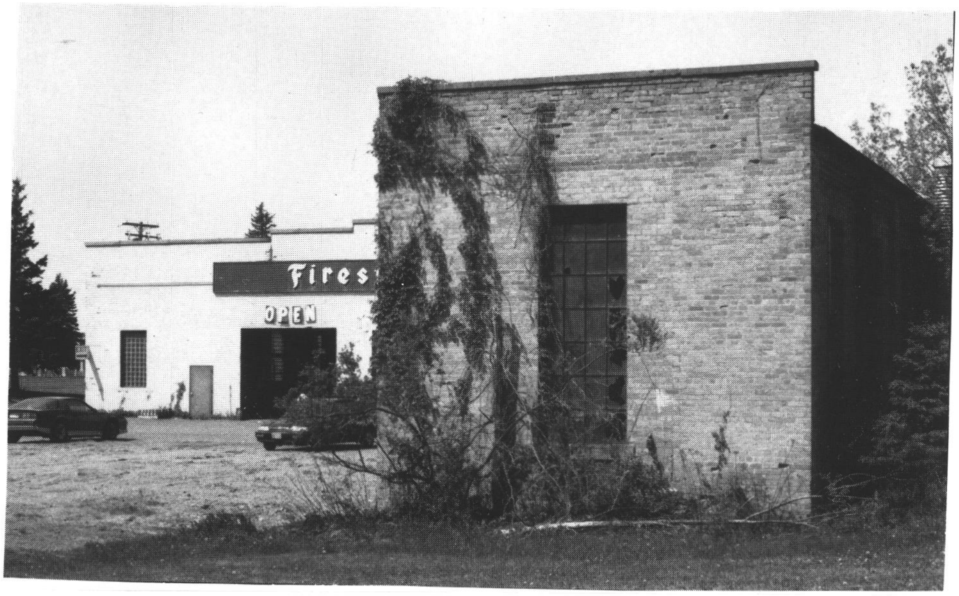
Above: The remains of passenger trailer 7 after the Virginia carhouse fire.

Ruins of the Virginia carhouse after the November, 1913, fire; part of passenger trailer 6 is visible to the right. (Wayne C. Olsen collection)

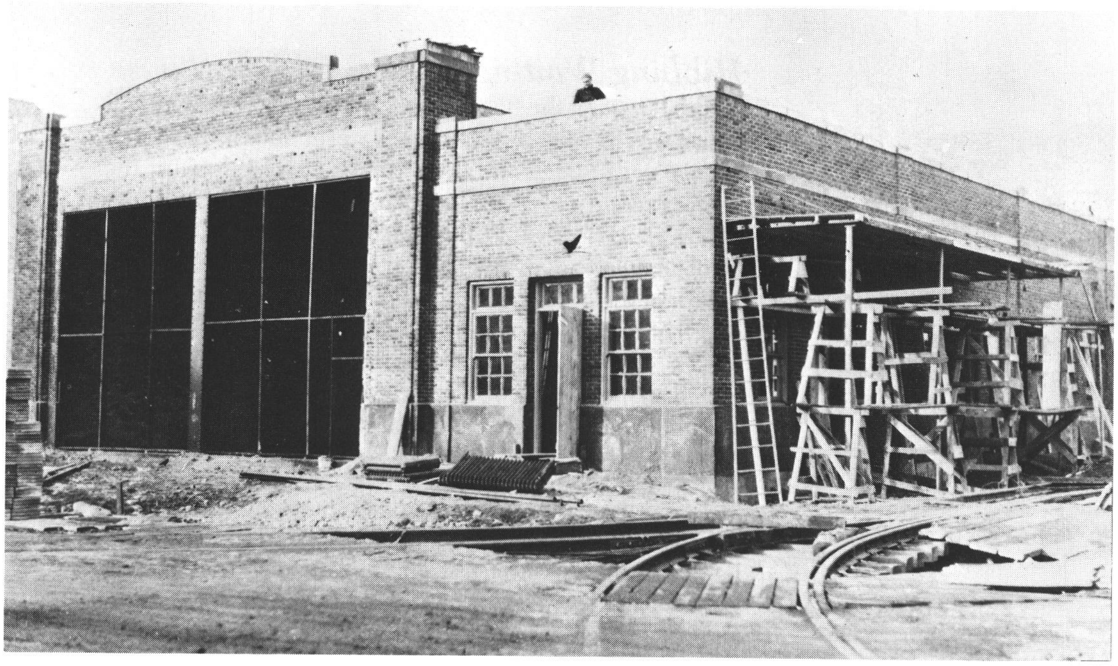




The rebuilt carhouse building at Virginia as it appeared in later years. The office building is out of the photograph to the left. (Jay O. Bergerson collection; St. Louis County Historical Society)



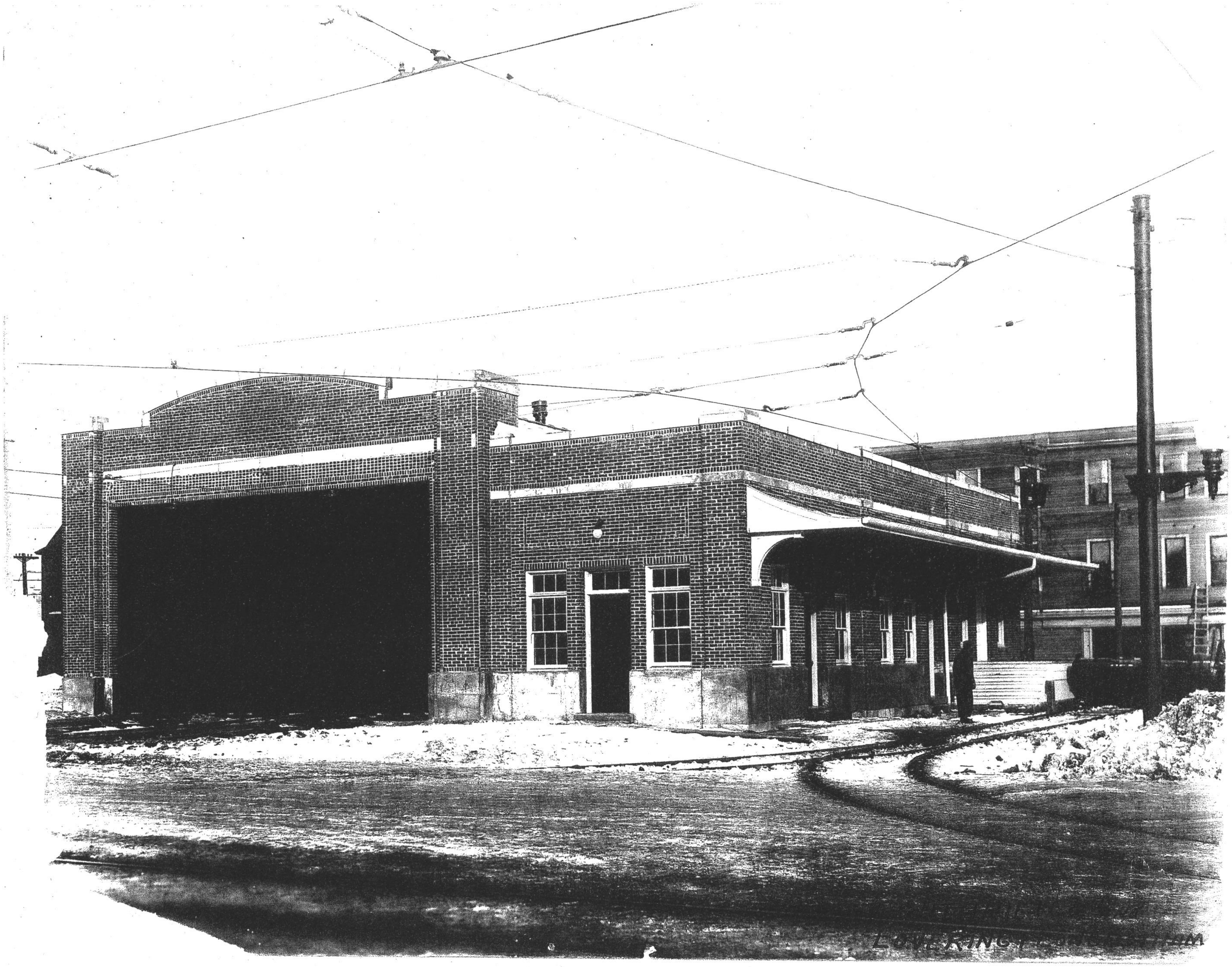
carhouse and Paint Shop as they appeared in 1992.



The carhouse-waiting station-substation building at 6th Ave. and Howard St., Hibbing, nearing completion, December 11, 1921. (Oliver Iron Mining Co.; Wayne C. Olsen collection)

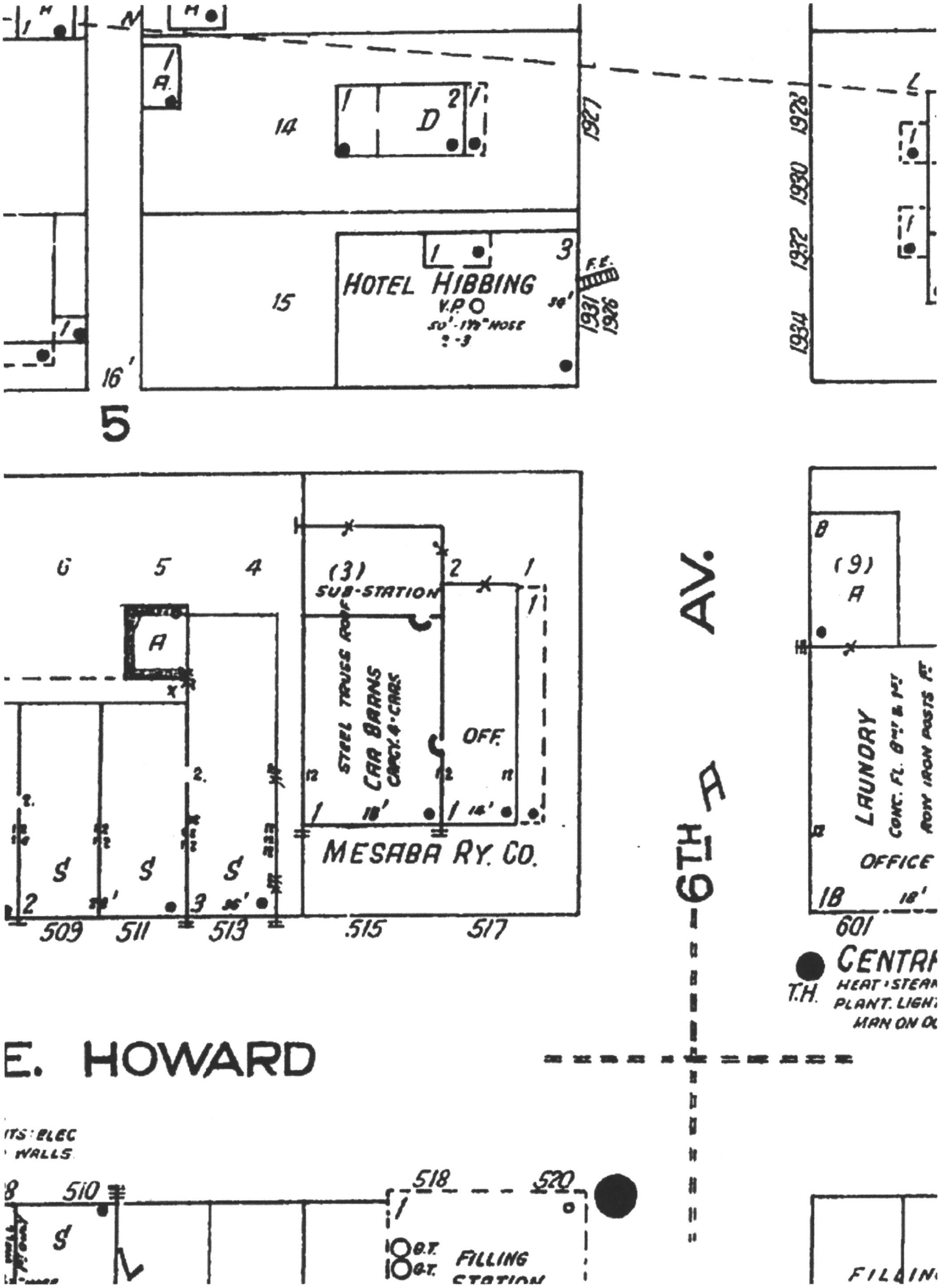
AVERY® PV119ED

12-11-1921

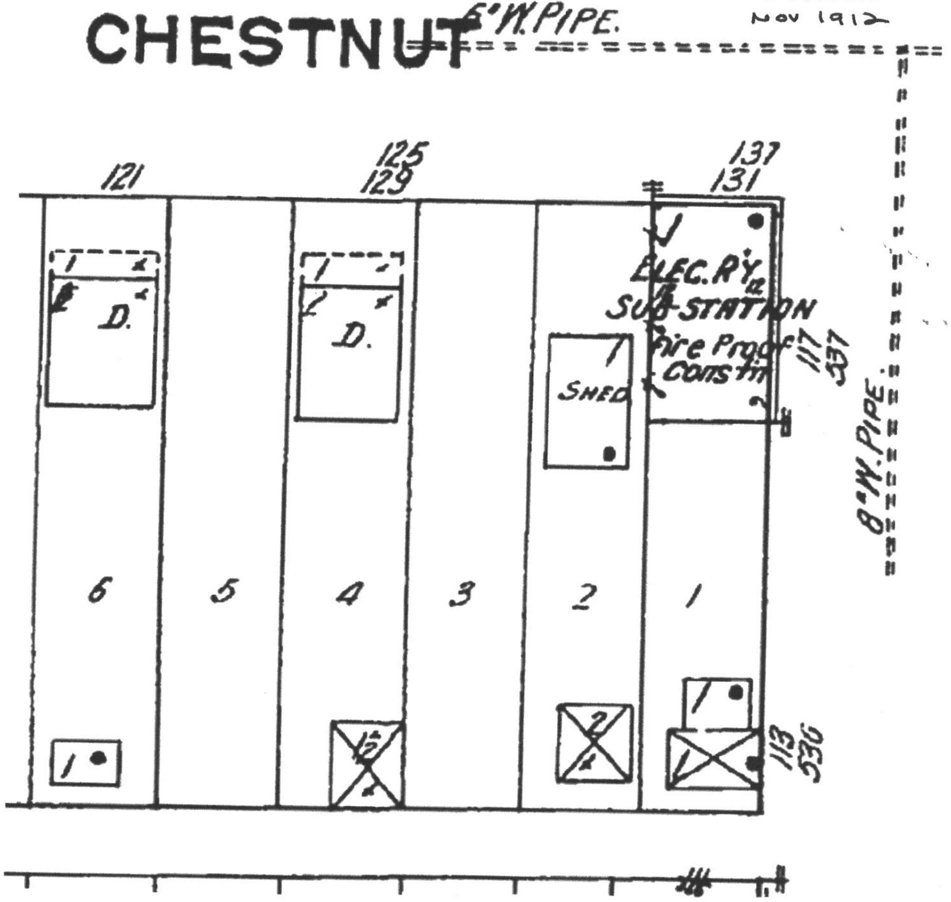

LOVERING

HIBBING

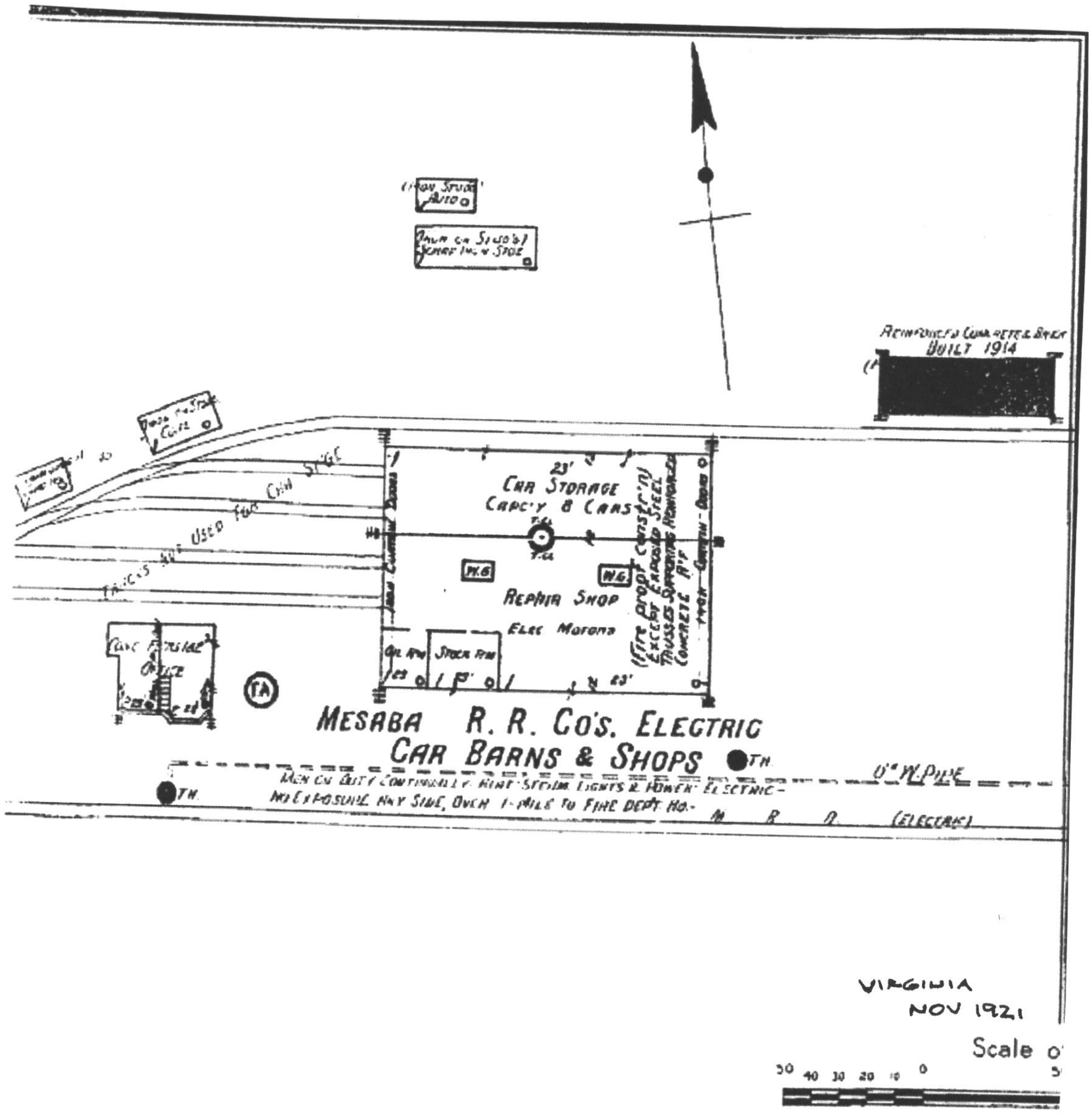
MAY 1926


HOTEL HIBBING
V.P.O
50'-1½" HOSE
2-3
F.E.
D
14
15
16'
5
1927
1928
1930
1932
1934
1931
1926
(3)
SUB-STATION
STEEL TRUSS ROOF
CAR BARNS
CAPCY. 4 CARS
OFF.
MESABA RY. CO.
509
511
513
515
517
6TH AV.
(9)
LAUNDRY
CONC. FL. BMT & 1ST
ROW IRON POSTS 1ST
OFFICE
601
CENTR
HEAT: STEAM
PLANT. LIGHT
MAN ON DU
T.H.
E. HOWARD
ITS: ELEC
WALLS
510
518
520
FILLING STATION
FILLIN

CHISHOLM
NOV 1912



CHESTNUT
6" W. PIPE.
121
125
129
137
131
D.
D.
ELEC. R'Y.
SUB-STATION
Fire Proof
Constn
SHED
117
337
8" W. PIPE.
6
5
4
3
2
1
113
536



REINFORCED CONCRETE & BRICK
BUILT 1914
TRACKS ARE USED FOR CAR STGE
CAR STORAGE
CAPC'Y 8 CARS
23'
W.G.
W.G.
REPAIR SHOP
ELEC MOTORS
(Fire proof constr'n)
EXCEPT EXPOSED STEEL
TRUSSES SUPPORTING REINFORCED
CONCRETE R'F
OIL RM
STOCK RM
1 F'
CAR F'RS'NS'
OFFICE
T.A.
MESABA R. R. CO'S. ELECTRIC
CAR BARNS & SHOPS
TH.
TH.
6" W. PIPE
MEN ON DUTY CONTINUALLY. HEAT: STEAM. LIGHTS & POWER: ELECTRIC.
NO EXPOSURE ANY SIDE, OVER 1 MILE TO FIRE DEPT. HO.
M R R (ELECTRIC)
Scale o
50 40 30 20 10 0 5

VIRGINIA
NOV 1921

OPERATIONS

Interurban Passenger and Express Service

The first car to operate over the newly completed line began providing hourly passenger service between the Virginia carhouse and Gilbert 12-24-1912. On Christmas day two-hourly service was begun between Buhl and Gilbert. On 1-22-1913 regular hourly service from 6:00 a.m. to midnight, daily, was inaugurated over the entire line from Hibbing to Gilbert using six cars. As track and equipment were broken in the running time was gradually decreased so that the regular hourly service car requirements were reduced to five cars 2-15-1913 and finally four cars 8-4-1913.

In many instances this service was not adequate and it became necessary to utilize all the passenger equipment the company owned to move the traffic. Most of the extra traffic was due to shift changes at the mines. This was handled by two-car trains consisting of a motor car with trailer. Two and three-car trains (motor car with two trailers) were run on weekends, holidays and special occasions. The largest proportion of passenger traffic was between Virginia and Eveleth. The carhouse was especially well-located to handle this as a trailer could be added to eastbound trains and removed from westbound trains as they passed the carhouse.

Express service was begun in mid-August 1913 with two trains in each direction, daily except Sunday, carrying general merchandise in less-than-carload lots. Rates charged were approximately 30% above the standard steam railroad freight rates. It was reported at this time that as the territory served was almost frontier in character, shippers and consumers were just beginning to realize the value of the high quality express service which the company offered.

The Time Table effective 7-24-1918 illustrates the typical passenger and express service provided. Meeting points on this timetable were scheduled for Boulder, Runquist, Center and Thomas sidings.

Passenger traffic between Virginia and Eveleth became sufficiently heavy to warrant addition of another run so as to provide half-hourly service between the two communities.

City Passenger Service

Local service was begun in Hibbing as a result of the line relocation between Hibbing and Chisholm. This line operated from the Hibbing Waiting Station wye connecting the new business district with North Hibbing and South Hibbing. Service began 12-11-1921 using two city passenger cars that had been acquired second-hand for this purpose.

Station Agents

Station agents were originally located at Hibbing, Chisholm, Buhl, Mountain Iron, Eveleth and Gilbert. By the early 1920's the number of agents and facilities had been expanded.

Agents operating from company-owned buildings were located at Hibbing (after 10-1-1920), Kitzville, Chisholm (substation building), Kinney and Mountain Iron.

Agents in rented facilities were located at Hibbing (until 10-1-1920), Buhl (drug store), Virginia-North Side (grocery store), Virginia-Center (confectionary store 1913-1917, drug store 1917-), Eveleth, Genoa (post office and confectionary store), and Gilbert (confectionary store and ice cream parlor).

Passenger Shelters
(Relocated Line)

Passenger shelters were installed at the following locations.

Station 4	Brooklyn
Station 6	Mitchell
Station 8	Albany
Station 14	Meyers
Station 20	Sharon
Station 21	
Station 23	Lucknow
Station 23½	east of Kinney
Station 24	
Station 24½	
Station 25	Kinross
Station 26	
Station 26½	
Station 29½	Brunt
Station 30	Mud Lake Road
Parkville	
Station 32	Virginia-North Side
Station 41½	west Eveleth
Station 44	east Eveleth

The structures at Stations 24, 24½ and 26 belonged to the Mountain Iron School.

Dispatching

The Egry train order system was used exclusively. All telephone booths as well as other points where train orders were received from the dispatcher were equipped with Egry dispatching machines. The train dispatcher's office was located in the Virginia office building.

The company telephone system was used for dispatching only and consisted of 24 Western Electric telephones on one circuit of #9 galvanized wire. The locations of the telephones are listed following, with (*) indicating a telephone booth.

Hibbing waiting station
Kitzville
Brooklyn-East Hibbing (Mitchell) siding (*)
Glen Spur siding (*)
Ballast (West Chisholm) siding (*)
Chisholm waiting station
Boulder siding (*)
Buhl wye (*)
Buhl station
Runquist siding (*)
Kinney
Williams siding (*)
Center siding (*)
Mountain Iron
Brunt siding (*)
Virginia carhouse
Virginia wye (*)
Virginia station
Thomas siding (*)
Summit gravel pit siding (*)
Eveleth
Sparta siding (*)
Gilbert station
Gilbert wye (*)

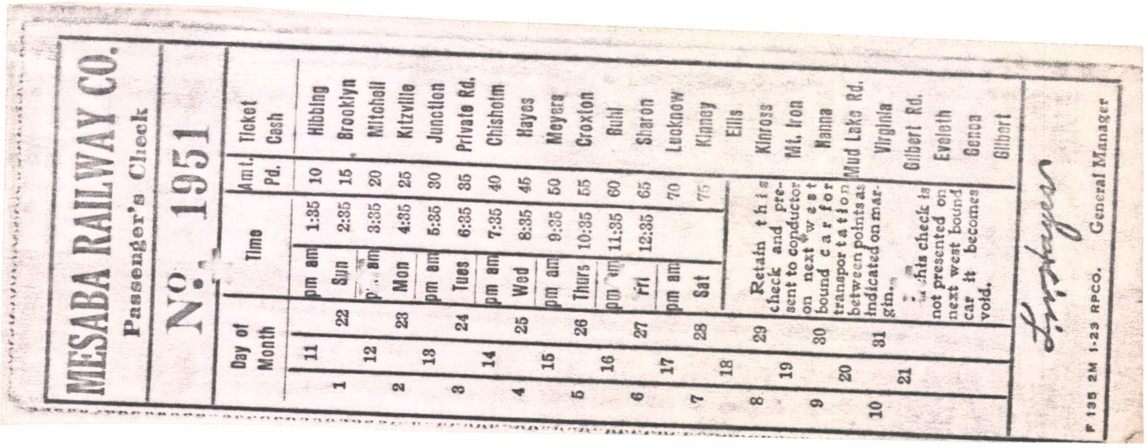
The Simmens Signal System

Located at each siding were three insulated sections of third rail, each about 75 ft. long. One rail was opposite the switch (home rail) and one rail 2000 ft. in each direction from the switch (distant rails). Each group of three sections was connected by one wire (the return circuit being thru the track rails) to a separate control switch on the dispatcher's control board. There was one control switch for each siding.

Each motor car was equipped with a third rail contact shoe mounted on the front truck, a contact shoe relay, battery for power, and two signal lights (red and green) in the motorman's cab.

The principal of the system was that if a contact rail was energized by the closing of a control switch, then a passing train would receive a clear signal; if a contact rail was de-energized by the opening of a control switch, then a passing train would receive a stop signal. A clear signal would continue to show while running thru the block; a stop signal would be displayed until the car reached an energized contact rail. The dispatcher could at any time stop any train at any siding.

Opposing movements of trains at a meeting point were controlled by the two outer third rail sections of the group, and the two trains which approached the same siding received stop signals as soon as they passed these outer sections, leaving each train about 2000 ft. in which to come to a stop. The dispatcher's control switches were interlocked so it was mechanically and electrically impossible for the dispatcher to give signals corresponding to a lap order, or to change signals once a train was in a block.



MESABA RAILWAY CO.
Passenger's Check
No. 1951

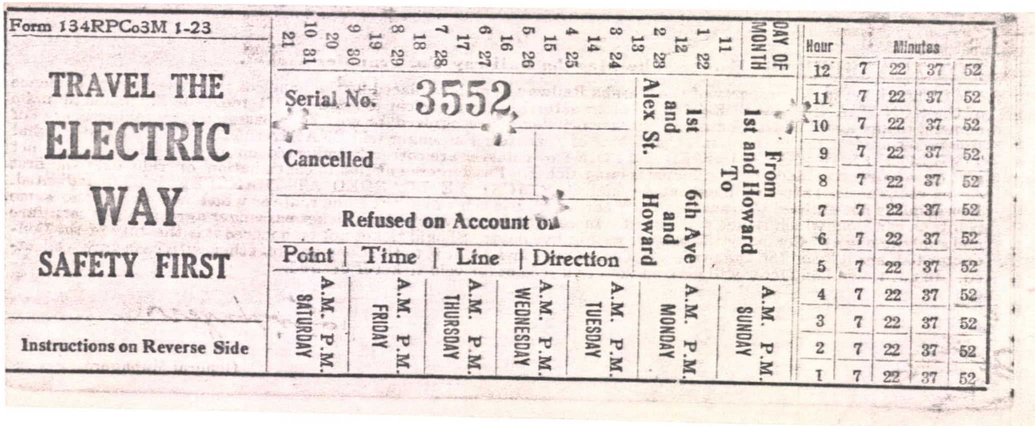
Day of Month				Time	Amt. Pd.	Ticket Cash
1	11		pm am	1:35	10	Hibbing
		22	Sun	2:35	15	Brooklyn
2	12		pm am	3:35	20	Mitchell
		23	Mon	4:35	25	Kitzville
3	13		pm am	5:35	30	Junction
		24	Tues	6:35	35	Private Rd.
4	14		pm am	7:35	40	Chisholm
		25	Wed	8:35	45	Hayes
5	15		pm am	9:35	50	Meyers
		26	Thurs	10:35	55	Croxton
6	16		pm am	11:35	60	Buhl
		27	Fri	12:35	65	Sharon
7	17		pm am		70	Lucknow
		28	Sat		75	Kinney
8	18					Ellis
		29				Kinross
9	19					Mt. Iron
		30				Nanna
10	20					Mud Lake Rd.
		31				Virginia
	21					Gilbert Rd.
						Eveleth
						Genoa
						Gilbert

Retain this check and present to conductor on next west bound car for transportation between points as indicated on margin.

If this check is not presented on next west bound car it becomes void.

General Manager

F 135 2M 1-23 RPCO.



Form 134RPCo3M 1-23

TRAVEL THE
ELECTRIC
WAY
SAFETY FIRST

Instructions on Reverse Side

DAY OF MONTH
11
1 22
12
2 23
13
3 24
14
4 25
15
5 26
16
6 27
17
7 28
18
8 29
19
9 30
20
10 31
21

Serial No. 3552

Cancelled

Refused on Account of

Point | Time | Line | Direction

From 1st and Howard To

1st and Alex St.

6th Ave and Howard

A.M. P.M. SUNDAY

A.M. P.M. MONDAY

A.M. P.M. TUESDAY

A.M. P.M. WEDNESDAY

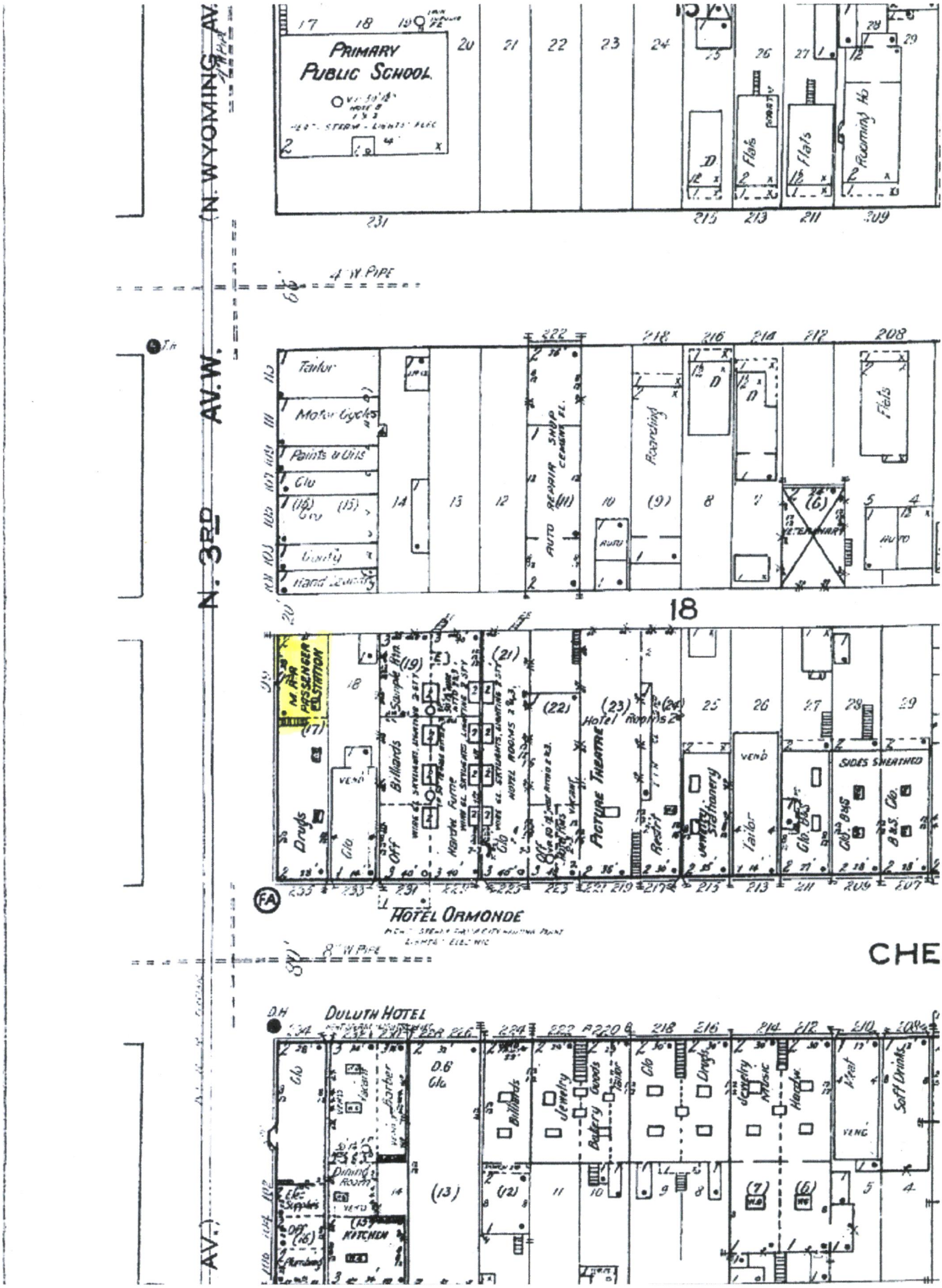
A.M. P.M. THURSDAY

A.M. P.M. FRIDAY

A.M. P.M. SATURDAY

Hour	Minutes			
12	7	22	37	52
11	7	22	37	52
10	7	22	37	52
9	7	22	37	52
8	7	22	37	52
7	7	22	37	52
6	7	22	37	52
5	7	22	37	52
4	7	22	37	52
3	7	22	37	52
2	7	22	37	52
1	7	22	37	52

VIRGINIA
NOV 1921


PRIMARY PUBLIC SCHOOL
(N. WYOMING AV.)
N. 3RD AV. W.
AV.)
4" W. PIPE
8" W. PIPE
18
Tailor
Motor Cycles
Paints & Oils
Clo
Candy
Hand Laundry
Auto Repair Shop
Boarding
Flats
Rooming Ho
Veterinary
Auto
M. & I.R. Passenger Station
Drugs
Clo
Billiards
Sample Rm.
Hardw. Furn.
Hotel Rooms 2 & 3
Picture Theatre
Hotel Rooms 2d
Restr
Stationery
Tailor
Sides Sheathed
HOTEL ORMONDE
DULUTH HOTEL
Barber
Dining Room
Kitchen
Elec. Supplies
Plumbing
D.G. Clo
Billiards
Jewelry
Bakery Goods
Tailor
Clo
Drugs
Jewelry Music
Hardw.
Meat
Soft Drinks
FA

CHESTNUT

FAST FREIGHT AND EXPRESS SERVICE

LEAVE	a. m.	p. m.
Hibbing		2 01
Chisholm		2 30
Buhl		3 00
Mt. Iron		3 35
Virginia	10-20	4 20
Eveleth	10 45	4 45
Genoa	10 51	4 51
Gilbert Ar	10 56	4 56

LEAVE	a. m.	p. m.
Gilbert	11 01	5 01
Genoa	11 06	5 06
Eveleth	11 14	5 14
Virginia	11 55	5 55
Mt. Iron	12 28	
Buhl	12 55	
Chisholm	1 25	
Hibbing Ar	1 50	

GENERAL INFORMATION

Passengers are requested to purchase tickets before entering trains at stations where an agent is on duty.

Children under five years of age, when accompanied by an adult, will be carried free; children of five and under twelve years of age will be carried at one-half the adult fare. In no case will the fare be less than 5c.

Fares cannot be adjusted by the conductors. In the event of any disagreement with the conductor relative to tickets required, privileges allowed, etc., passengers should pay the conductor, take his receipt and refer the case to the Superintendent, Virginia, Minn., for adjustment. The conductor is governed by rules he cannot change.

Articles found in the company's cars are taken to the General Office, Virginia, Minn., where they may be claimed by owners.

BAGGAGE—consists of wearing apparel, articles of personal adornment, toilet articles and similar effects, necessary and appropriate for wear, use, comfort and convenience of the passenger, for the purposes of the journey and not intended for other persons or sale. One hundred and fifty (150) pounds of baggage not exceeding one hundred (100) dollars in value for each adult and seventy-five (75) pounds not exceeding fifty (50) dollars in value for each child will be carried free, only on presentation of valid transportation on which the adult or child passenger, as the case may be, is to travel. Baggage exceeding the foregoing weight and value limitation will be charged for. This company does not guarantee to forward or carry baggage on the same train as passenger nor by any particular train A single piece of baggage weighing over 250 pounds will not be checked. Passengers having baggage destined to non-agency stations must notify the conductor and surrender the duplicate check before arrival at destination, otherwise it will be carried to the next station where an agent is on duty, and held for further orders.

MESABA RAILWAY CO.

HOURLY SERVICE TO IMPORTANT POINTS
ON THE MESABA RANGE

* * *

THE RANGE INTERURBAN

CONNECTING
GILBERT GENOA
EVELETH VIRGINIA
MOUNTAIN IRON
KINNEY SHARON
BUHL CHISHOLM
HIBBING

* * *

TIME TABLE

IN EFFECT JULY 24TH, 1918
SUBJECT TO CHANGE WITHOUT NOTICE

L. W. HAYES. SUPERINTENDENT
VIRGINIA, MINNESOTA

TRAVEL THE ELECTRIC WAY

PASSENGER SERVICE

STATIONS	EAST BOUND																					
	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	noon	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.‡	p.m.	p.m.	p.m.	p.m.†	p.m.	m.*	a.m.
HIBBING Y Lv.			6 00	7 00	8 00	9 00	10 00	11 00	12 00	1 00	2 00	3 00	4 00	5 00	6 00	7 00	8 00	9 00	10 00	11 00	12 00	1 00
HIBBING			6 03	7 03	8 03	9 03	10 03	11 03	12 03	1 03	2 03	3 03	4 03	5 03	6 03	7 03	8 03	9 03	10 03	11 03	12 03	1 03
LAVINIA			6 12	7 12	8 12	9 12	10 12	11 12	12 12	1 12	2 12	3 12	4 12	5 12	6 12	7 12	8 12	9 12	10 12	11 12	12 12	1 12
CHISHOLM			6 22	7 22	8 22	9 22	10 22	11 22	12 22	1 22	2 22	3 22	4 22	5 22	6 22	7 22	8 22	9 22	10 22	11 22	12 22	1 22
MEYERS			6 27	7 27	8 27	9 27	10 27	11 27	12 27	1 27	2 27	3 27	4 27	5 27	6 27	7 27	8 27	9 27	10 27	11 27	12 27	
CROXTON			6 33	7 33	8 33	9 33	10 33	11 33	12 33	1 33	2 33	3 33	4 33	5 33	6 33	7 33	8 33	9 33	10 33	11 33	12 33	
BUHL		5 38	6 38	7 38	8 38	9 38	10 38	11 38	12 38	1 38	2 38	3 38	4 38	5 38	6 38	7 38	8 38	9 38	10 38	11 38	12 38	
SHARON		5 42	6 42	7 42	8 42	9 42	10 42	11 42	12 42	1 42	2 42	3 42	4 42	5 42	6 42	7 42	8 42	9 42	10 42	11 42	12 42	
LUCKNOW		5 44	6 44	7 44	8 44	9 44	10 44	11 44	12 44	1 44	2 44	3 44	4 44	5 44	6 44	7 44	8 44	9 44	10 44	11 44	12 44	
KINNEY		5 46	6 46	7 46	8 46	9 46	10 46	11 46	12 46	1 46	2 46	3 46	4 46	5 46	6 46	7 46	8 46	9 46	10 46	11 46	12 46	
KINROSS		5 55	6 55	7 55	8 55	9 55	10 55	11 55	12 55	1 55	2 55	3 55	4 55	5 55	6 55	7 55	8 55	9 55	10 55	11 55	12 55	
MT. IRON		6 02	7 02	8 02	9 02	10 02	11 02	12 02	1 02	2 02	3 02	4 02	5 02	6 02	7 02	8 02	9 02	10 02	11 02	12 02	1 02	
HANNA		6 05	7 05	8 05	9 05	10 05	11 05	12 05	1 05	2 05	3 05	4 05	5 05	6 05	7 05	8 05	9 05	10 05	11 05	12 05	1 05	
OLCOTT PARK	5 14	6 14	7 14	8 14	9 14	10 14	11 14	12 14	1 14	2 14	3 14	4 14	5 14	6 14	7 14	8 14	9 14	10 14	11 14	12 14	1 14	
OLIVER SHOPS	5 15	6 15	7 15	8 15	9 15	10 15	11 15	12 15	1 15	2 15	3 15	4 15	5 15	6 15	7 15	8 15	9 15	10 15	11 15	12 15		
VIRGINIA	5 20	6 20	7 20	8 20	9 20	10 20	11 20	12 20	1 20	2 20	3 20	4 20	5 20	6 20	7 20	8 20	9 20	10 20	11 20	12 20		
EVELETH	5 42	6 42	7 42	8 42	9 42	10 42	11 42	12 42	1 42	2 42	3 42	4 42	5 42	6 42	7 42	8 42	9 42	10 42	11 42			
GENOA	5 49	6 49	7 49	8 49	9 49	10 49	11 49	12 49	1 49	2 49	3 49	4 49	5 49	6 49	7 49	8 49	9 49	10 49	11 49			
GILBERT Ar.	5 54	6 54	7 54	8 54	9 54	10 54	11 54	12 54	1 54	2 54	3 54	4 54	5 54	6 54	7 54	8 54	9 54	10 54	11 54			

*Will run to Virginia for passengers. All trains daily.

†Last train to carry baggage.

‡Last train to Gilbert.

STATIONS	WEST BOUND																					
	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	noon	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.†	p.m.	p.m.	p.m.	p.m.	p.m.*	m.
GILBERT Lv.				6 00	7 00	8 00	9 00	10 00	11 00	12 00	1 00	2 00	3 00	4 00	5 00	6 00	7 00	8 00	9 00	10 00	11 00	12 00
GENOA				6 08	7 08	8 08	9 08	10 08	11 08	12 08	1 08	2 08	3 08	4 08	5 08	6 08	7 08	8 08	9 08	10 08	11 08	12 08
EVELETH				6 16	7 16	8 16	9 16	10 16	11 16	12 16	1 16	2 16	3 16	4 16	5 16	6 16	7 16	8 16	9 16	10 16	11 16	12 16
VIRGINIA	5 00			6 35	7 35	8 35	9 35	10 35	11 35	12 35	1 35	2 35	3 35	4 35	5 35	6 35	7 35	8 35	9 35	10 35	11 35	12 35
OLIVER SHOPS	5 05			6 40	7 40	8 40	9 40	10 40	11 40	12 40	1 40	2 40	3 40	4 40	5 40	6 40	7 40	8 40	9 40	10 40	11 40	12 40
OLCOTT PARK	5 06		5 41	6 41	7 41	8 41	9 41	10 41	11 41	12 41	1 41	2 41	3 41	4 41	5 41	6 41	7 41	8 41	9 41	10 41	11 41	12 41
HANNA	5 13		5 51	6 51	7 51	8 51	9 51	10 51	11 51	12 51	1 51	2 51	3 51	4 51	5 51	6 51	7 51	8 51	9 51	10 51	11 51	
MT IRON	5 15		5 54	6 54	7 54	8 54	9 54	10 54	11 54	12 54	1 54	2 54	3 54	4 54	5 54	6 54	7 54	8 54	9 54	10 54	11 54	
KINROSS	5 20		6 03	7 03	8 03	9 03	10 03	11 03	12 03	1 03	2 03	3 03	4 03	5 03	6 03	7 03	8 03	9 03	10 03	11 03	12 03	
KINNEY	5 29		6 12	7 12	8 12	9 12	10 12	11 12	12 12	1 12	2 12	3 12	4 12	5 12	6 12	7 12	8 12	9 12	10 12	11 12	12 12	
LUCKNOW	5 30		6 13	7 13	8 13	9 13	10 13	11 13	12 13	1 13	2 13	3 13	4 13	5 13	6 13	7 13	8 13	9 13	10 13	11 13	12 13	
SHARON	5 32		6 15	7 15	8 15	9 15	10 15	11 15	12 15	1 15	2 15	3 15	4 15	5 15	6 15	7 15	8 15	9 15	10 15	11 15	12 15	
BUHL	5 36		6 20	7 20	8 20	9 20	10 20	11 20	12 20	1 20	2 20	3 20	4 20	5 20	6 20	7 20	8 20	9 20	10 20	11 20	12 20	
CROXTON			6 25	7 25	8 25	9 25	10 25	11 25	12 25	1 25	2 25	3 25	4 25	5 25	6 25	7 25	8 25	9 25	10 25	11 25	12 25	
MEYERS			6 30	7 30	8 30	9 30	10 30	11 30	12 30	1 30	2 30	3 30	4 30	5 30	6 30	7 30	8 30	9 30	10 30	11 30	12 30	
CHISHOLM		5 34	6 34	7 34	8 34	9 34	10 34	11 34	12 34	1 34	2 34	3 34	4 34	5 34	6 34	7 34	8 34	9 34	10 34	11 34	12 34	
LAVINIA		5 43	6 43	7 43	8 43	9 43	10 43	11 43	12 43	1 43	2 43	3 43	4 43	5 43	6 43	7 43	8 43	9 43	10 43	11 43	12 43	
HIBBING		5 52	6 52	7 52	8 52	9 52	10 52	11 52	12 52	1 52	2 52	3 52	4 52	5 52	6 52	7 52	8 52	9 52	10 52	11 52	12 52	
HIBBING Y Ar.		5 56	6 56	7 56	8 56	9 56	10 56	11 56	12 56	1 56	2 56	3 56	4 56	5 56	6 56	7 56	8 56	9 56	10 56	11 56	12 56	

***Last train to Hibbing. †Last train to carry baggage. All trains daily.**

Connections made with steam railroads as shown below.

VIRGINIA—Duluth, Missabe & Northern; Duluth, Winnipeg & Pacific; Duluth & Iron Range.

HIBBING—Duluth, Missabe & Northern; Great Northern. EVELETH—Duluth, Missabe & Northern.

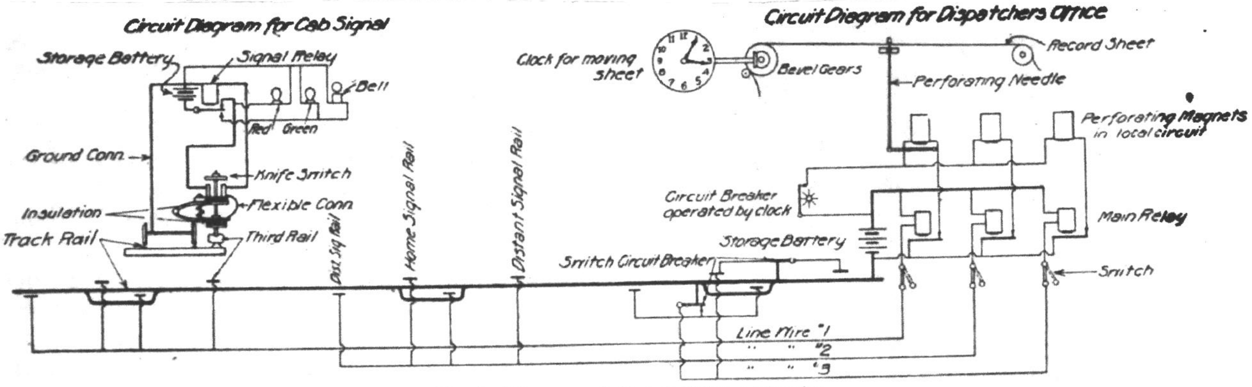

Circuit Diagram for Cab Signal
Storage Battery
Signal Relay
Bell
Red
Green
Ground Conn.
Knife Switch
Flexible Conn
Insulation
Track Rail
Third Rail
Dist. Sig. Rail
Home Signal Rail
Distant Signal Rail
Circuit Diagram for Dispatchers Office
Clock for moving sheet
Bevel Gears
Record Sheet
Perforating Needle
Perforating Magnets in local circuit
Circuit Breaker operated by clock
Storage Battery
Switch Circuit Breaker
Main Relay
Switch
Line Wire #1
" " #2
" " #3

Fig. 2—Diagram of Signal Wiring Circuits

Simmen Signal System. The Simmen signal system provides a means whereby a signal may be set on a train by the dispatcher and a continuous record showing the location of all trains and the speeds at which they are running through the blocks is drawn in the dispatcher's office. The system operates independently of the train propulsion current supply. The circuits of this system divide into two main parts; the main control circuit (Fig. 27) and the car circuit (Fig. 28). Three sections of third rail (each about 75 ft. long) at the sidings are connected by line wire to relays, dispatcher's control switches and a battery in the dispatcher's office. The return is over the track rails. The car equipment consists essentially of a third-rail shoe, local battery, relay and two signal lamps (one red and one green). The short lengths of contact rail are located one opposite the switch and two others, 2000 ft. distant in each direction. The rail at the siding is called the home rail and the other two are called distant rails. By means of the two rails located 2000 ft. from the siding it is possible to inform the crew of its signal, sufficiently far in advance to permit the stop to be made before the siding is reached. That is to say, if two trains are approaching a siding where they are to meet, they will receive red signals when 4000 ft. apart and each train will yet have 2000 ft. distance remaining in which to come under control to make the siding stop. When a car passes, the

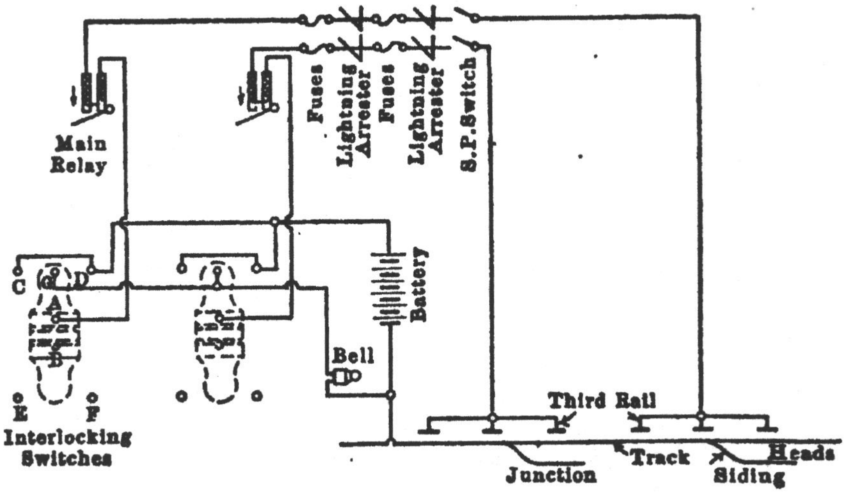

Main Relay
Fuses
Lightning Arrester
Fuses
Lightning Arrester
S.P. Switch
Battery
C
D
A
B
E
F
Bell
Interlocking Switches
Third Rail
Track
Heads
Junction
Siding

Fig. 27.—Main control circuits, Simmen signal system.

contact shoe attached to the side of the truck touches the third rail. The circuit is then completed through a relay on the car and through the running gear of the car to the rail. Thus the car relay is put in series with the relay and the control switch at the dispatcher's office. If a contact rail is energized (by the closing of the dispatcher's control switch) a "clear" signal will be given on a train passing the contact rail. A "clear" signal received in entering a new block will continue to show "clear" throughout the block, and a "danger" signal once displayed will continue at "danger" until it is automatically cleared when a train is passing an energized third rail. The third rail has inclined approaches at each end. When the contact shoe (Fig. 28) approaches the third rail, the shoe is raised and arm *R* of the contact shoe separates from front stop *S*. If the third rail is energized a circuit is established through the dispatcher's office. With this circuit energized the relay will be energized and its armature will close the circuit through a green or "clear" signal lamp, as well as another circuit to front stop *S*. As soon as the shoe leaves a third rail a spring forces contact arm *R* against front stop *S*, thus closing a local holding circuit. In this manner the "clear" signal is continued throughout the entire block entered. When a car passes a de-energized rail a "danger" signal is displayed and held until an energized third rail is passed. The dispatcher's switches are interlocked to prevent the dispatcher giving a "clear" signal to a train at one end of a block before a "danger" signal is set against an opposing train at the other end of the block. A record of the movement of trains is made on a train sheet driven by clockwork. Elapsed time is measured on the sheet in the direction of motion of the sheet and train location (by blocks) is given perpendicular to this direction. The record is made by needles operated by electromagnets controlled by the main relays in the dispatcher's control switch circuits. There are two needles for each block, one needle records the movement of a train running in one direction through a block and the other needle records the movement of a train running in the other direction through that block. The record is given by a slit cut in the paper by a needle which is made to continue cutting the slit throughout the time a train bound in the direction for which that needle records is in the block represented by that needle.

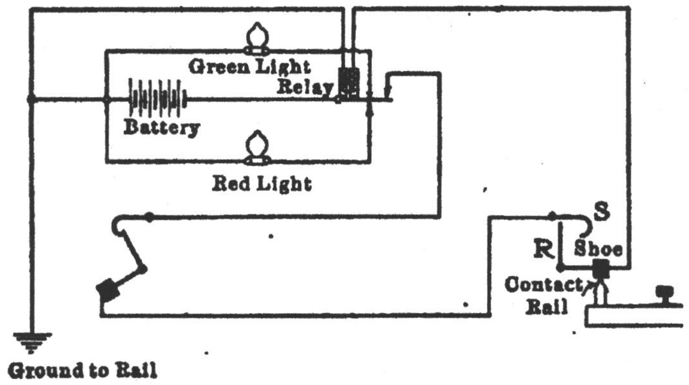
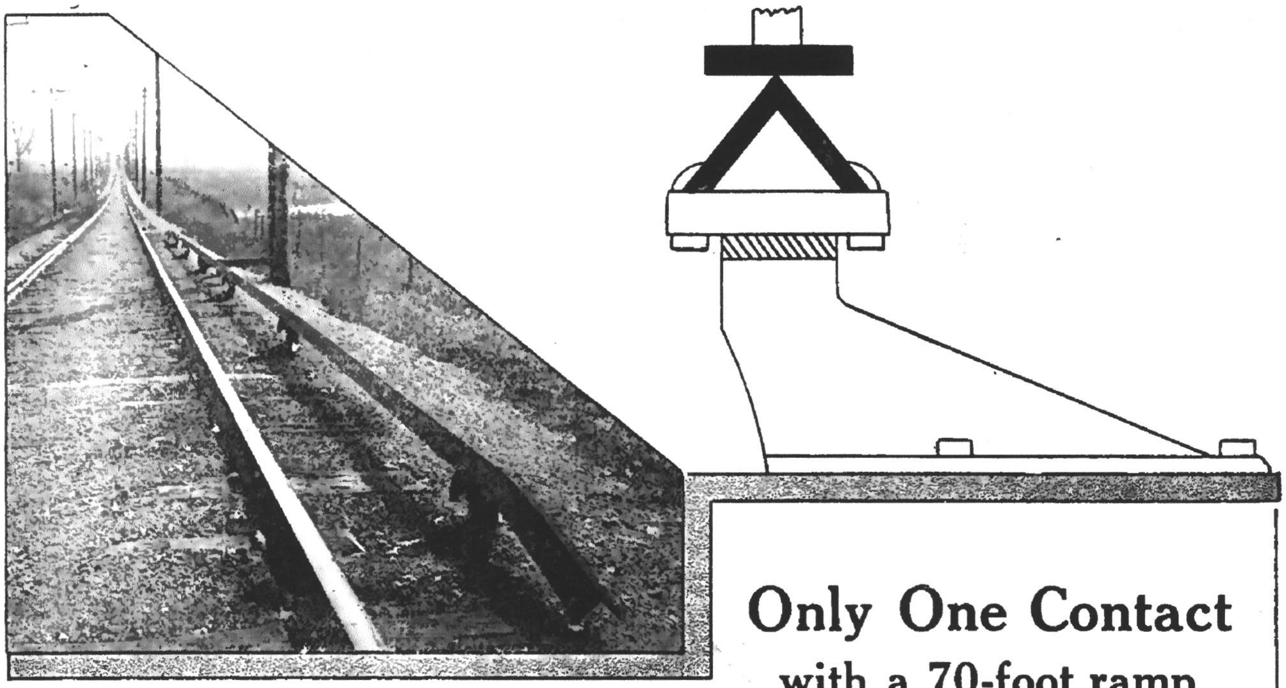


FIG. 28.—Car circuit, Simmen signal system.



Only One Contact
with a 70-foot ramp
is required by the

SIMMEN SYSTEM

of Continuous Cab Signals

A great many people associate the idea of **continuous cab signals** with a continuous third rail. We presume that it is but natural to confuse the two ideas. The **fact** is that the third-rail equipment for a block consists of **only four sections** of ramp, each 70 feet long.

A west bound train makes contact with a "distant" rail 2000 feet from the siding and receives the dispatcher's orders. If a "meet" is to be made the cab light changes from **green to red.** The motorman has ample braking distance, **and the red light continues to burn.** He can't miss it or misinterpret it.

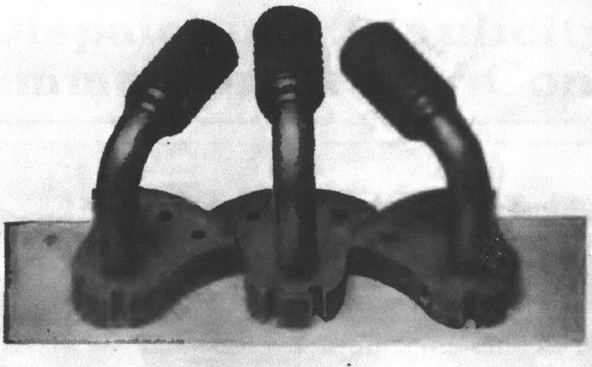
An east bound train also makes contact with a "distant" and "home" rail. The "inferior" train takes the siding, and when it is in the clear the dispatcher changes the signal in the cab of the "superior" train from red to green. After the "superior" train has left, the dispatcher reverses the control lever for that siding, and the "inferior" train then receives a clear signal as soon as its contact shoe touches the ramp.

There is no occasion to change the signal until the next block is approached, for the dispatcher's interlock makes lap orders impossible. The cab signal remains green and the motorman knows he has "right of way." We may also add that only one wire is necessary for all four contact rails. Positive current signals the east bound and negative current the west bound train.

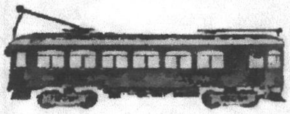
Simmen Automatic Railway Signal Co.

1575 Niagara Street, Buffalo, N. Y.

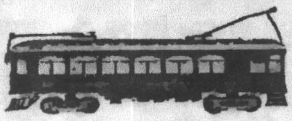
Pacific Coast Representative—W. H. CRAWFORD, 609 Spalding Building, Portland, Oregon



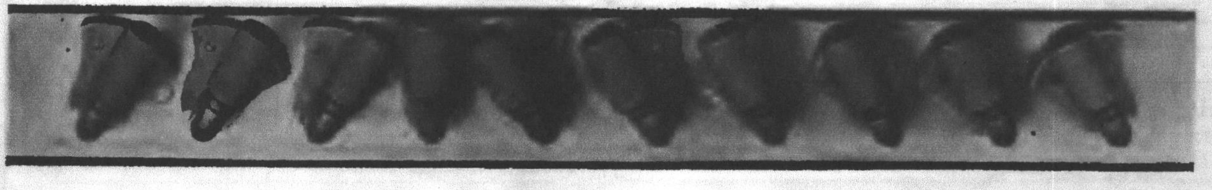
East Bound Car



West Bound Car



The INTERLOCK that makes LAP ORDERS Impossible



with the

SIMMEN SYSTEM

of Continuous Cab Signals

The device shown above is another example of the simplicity of the Simmen System. By means of this simple mechanical arrangement lap orders are positively prevented. The dispatcher cannot make a mistake.

Each lever controls a signal point and has three definite positions. The upright position indicates that a "meet" is scheduled for that siding, and therefore gives a red signal to trains approaching from both directions.

The levers leaning to the right give the green signal to east bound trains only. The levers leaning to the left give the green signal to west bound trains only.

These control levers are arranged in the same consecutive order that the signal points which they control are arranged on the railroad. It will be obvious that the simple segment which moves with each control lever prevents setting any given lever in the east bound clear position, when the lever controlling the adjacent siding is in the west bound clear position. Thus lap orders are prevented.

The Simmen System enables the dispatcher—miles away—to give a positive continuous signal *in the cab* of the train and the train itself gives the dispatcher a return signal *automatically*. The method is so simple that many railroad men can scarcely believe it possible, until they have been convinced by a personal investigation.

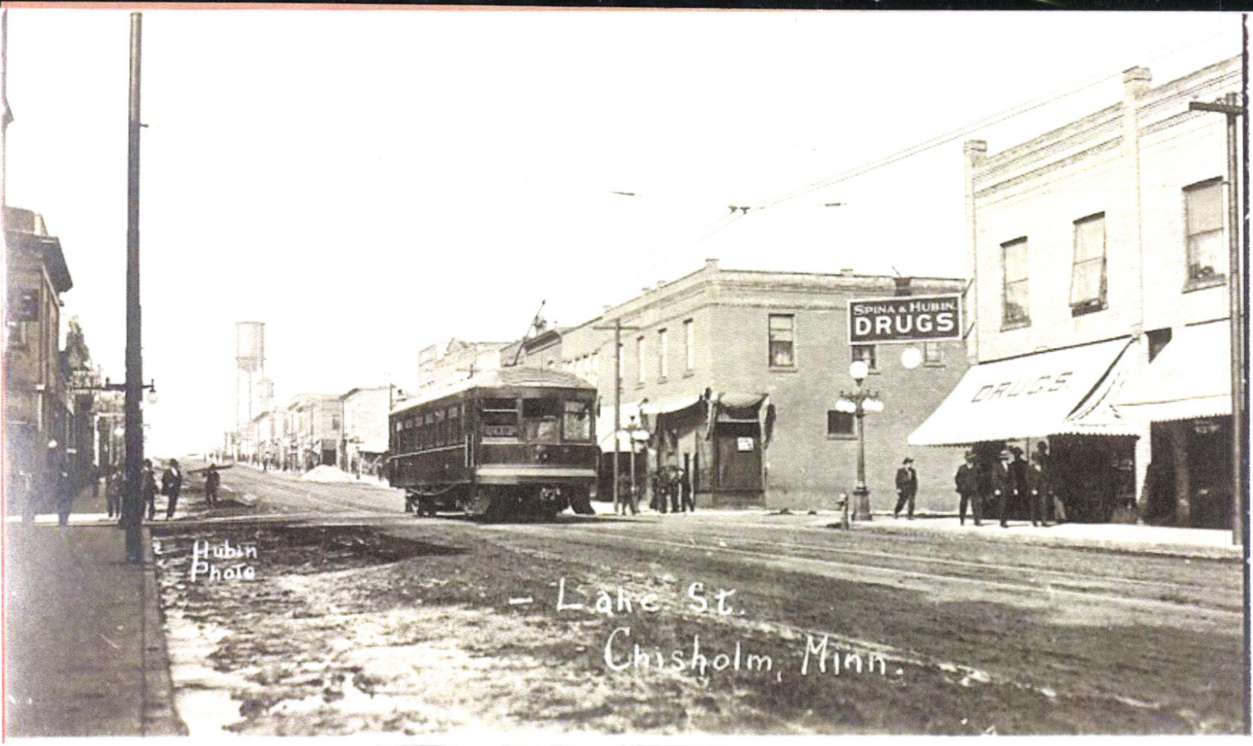
Why not decide today to investigate the Simmen System thoroughly? You will be interested and enlightened and may profit by the experience.

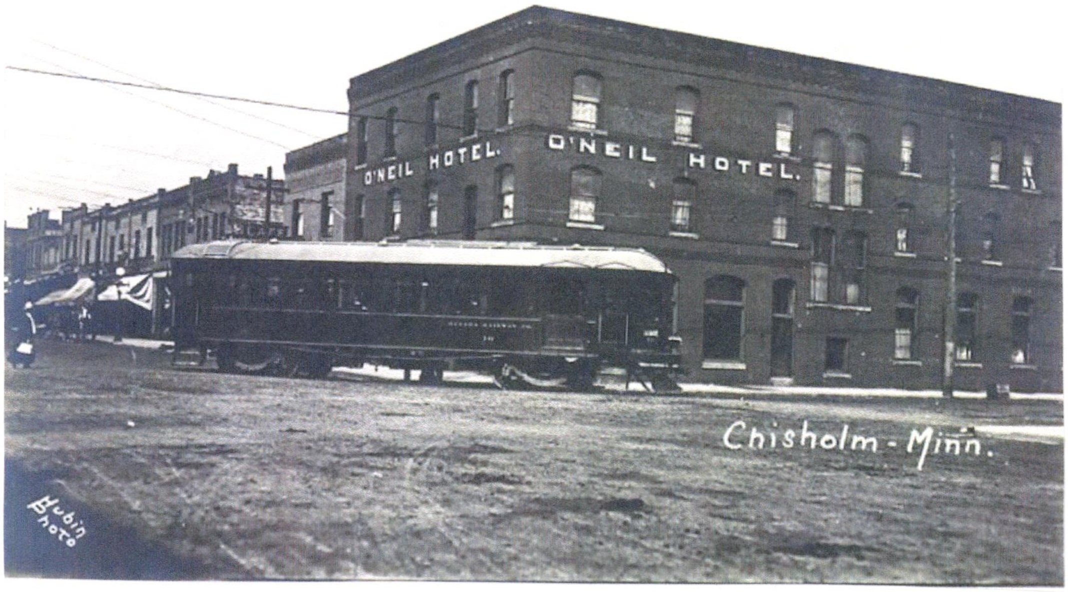
Simmen Automatic Railway Signal Co.

1575 Niagara Street, Buffalo, N. Y.

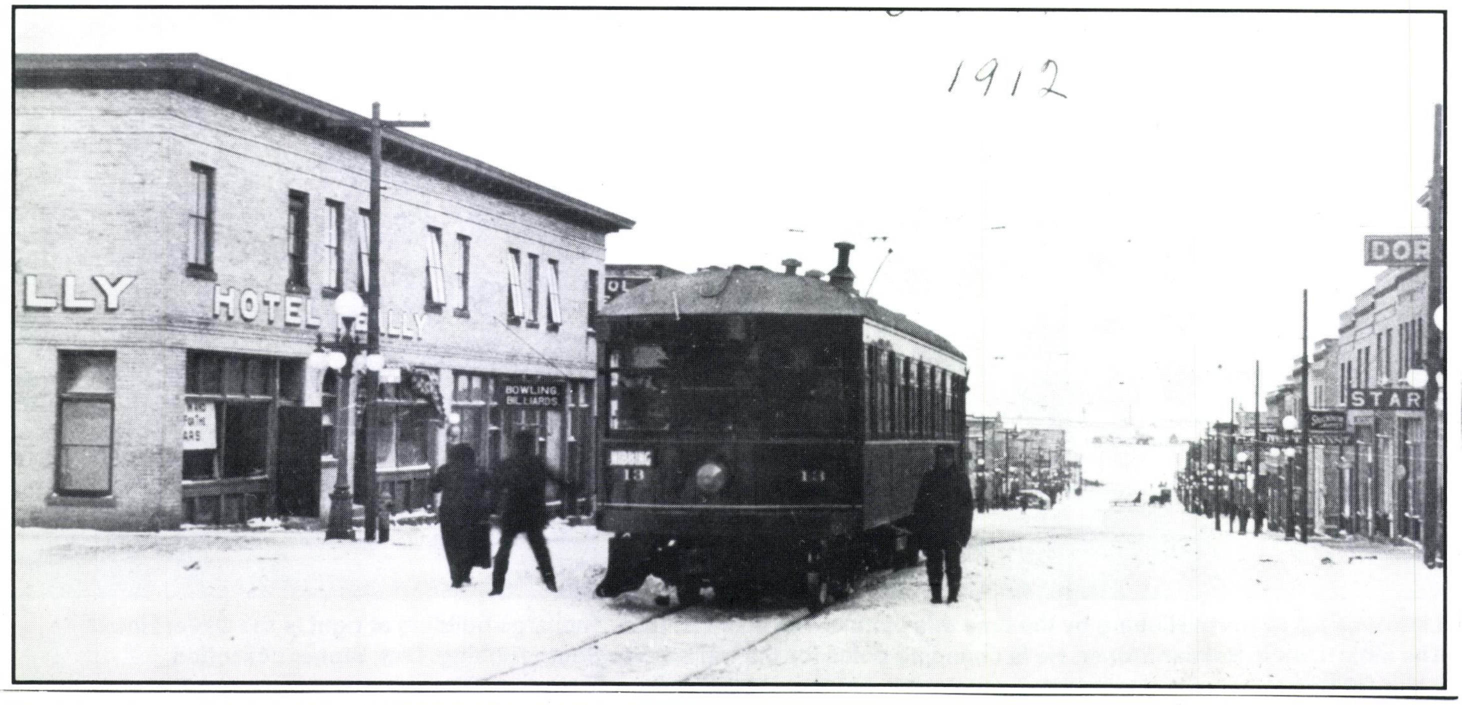
PACIFIC COAST REPRESENTATIVE—W. H. Crawford, 609 Spalding Bldg., Portland, Oregon

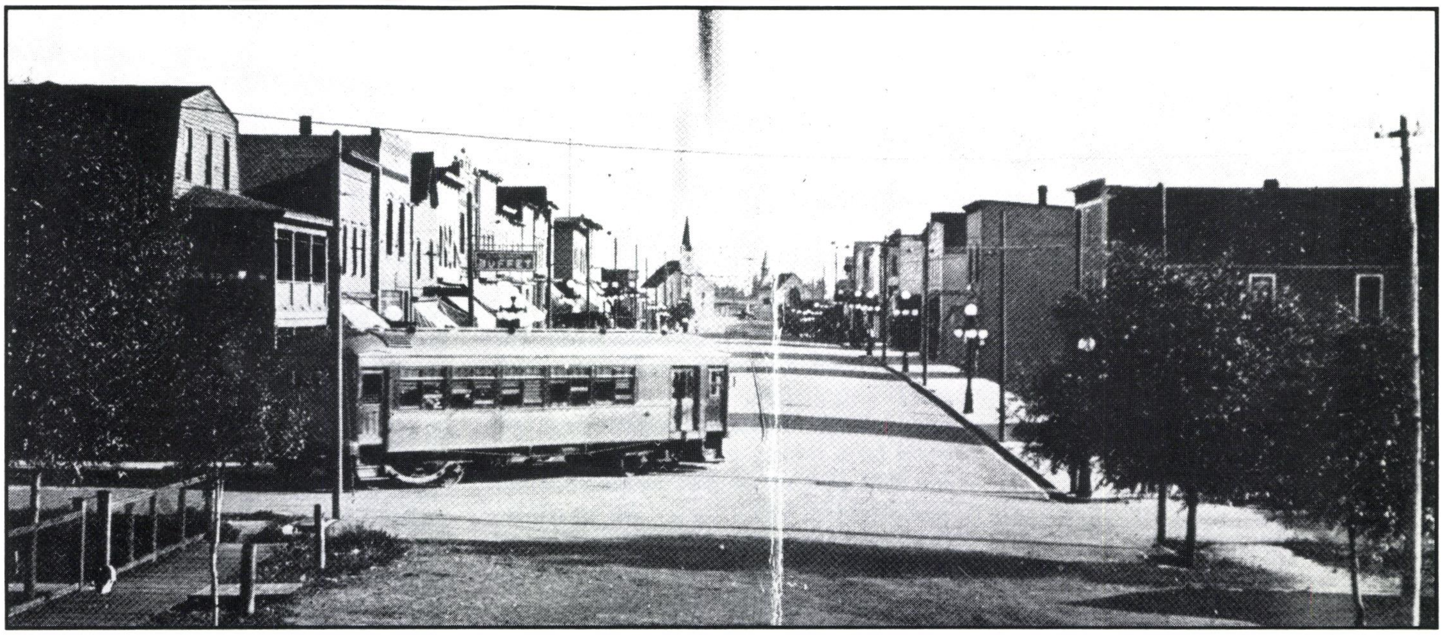
PV119ED AVERY™


SPINA & HUBIN DRUGS
DRUGS
Hubin Photo
Lake St.
Chisholm, Minn.

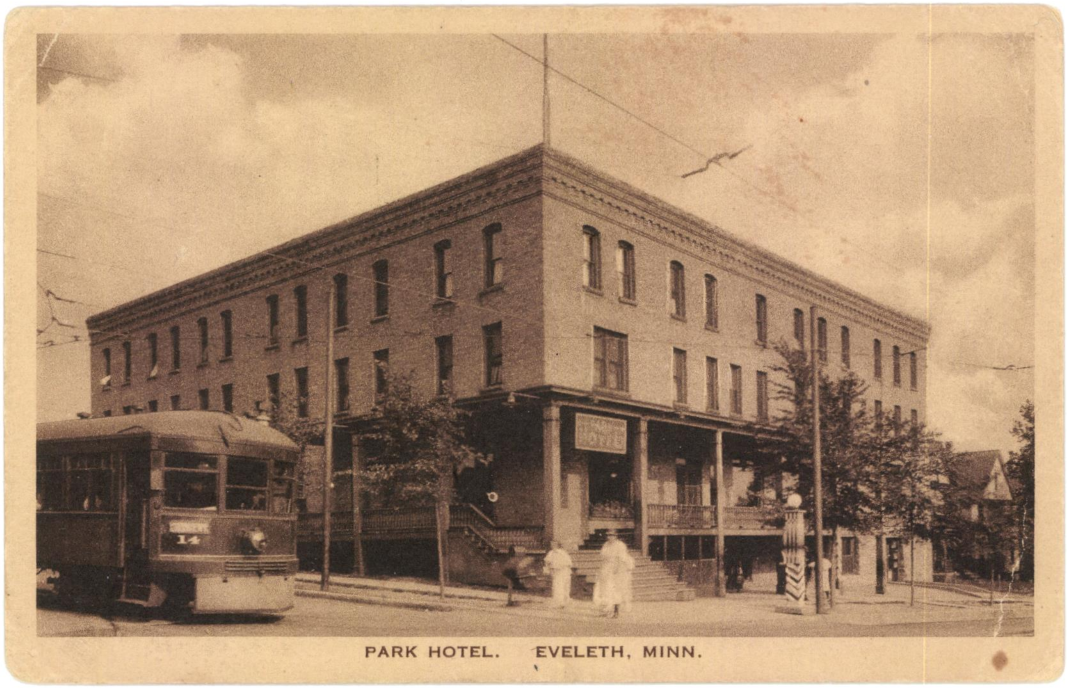

O'NEIL HOTEL.
O'NEIL HOTEL.
Chisholm - Minn.
Hubin Photo

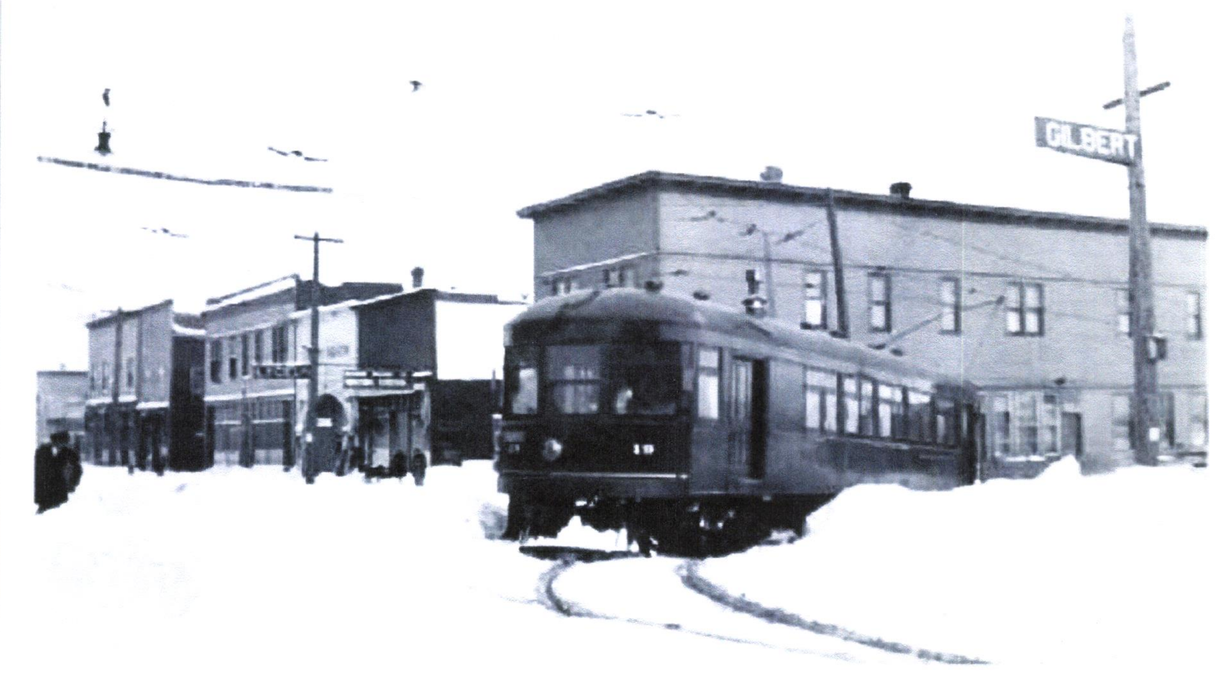
A westbound car stops at the top of the Lake Street hill in Chisholm. Ironworld collection.


1912
LLY
HOTEL KELLY
BOWLING BILLIARDS
HIBBING 13
13
DOR
STAR

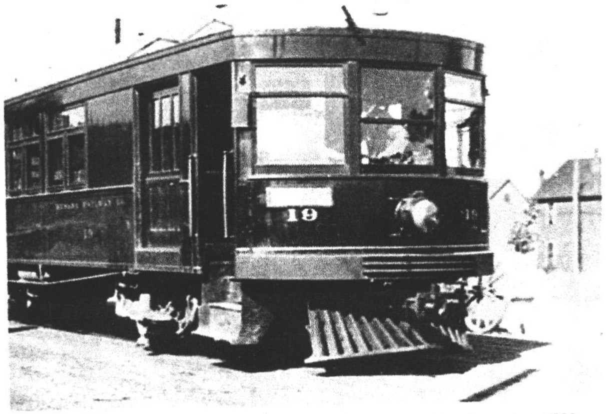


A westbound combine turns south onto State Street in Buhl. Ironworld collection.

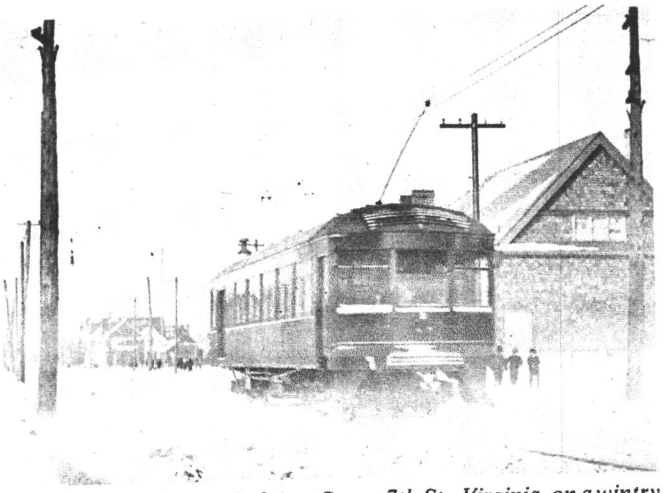

14
PARK HOTEL. EVELETH, MINN.



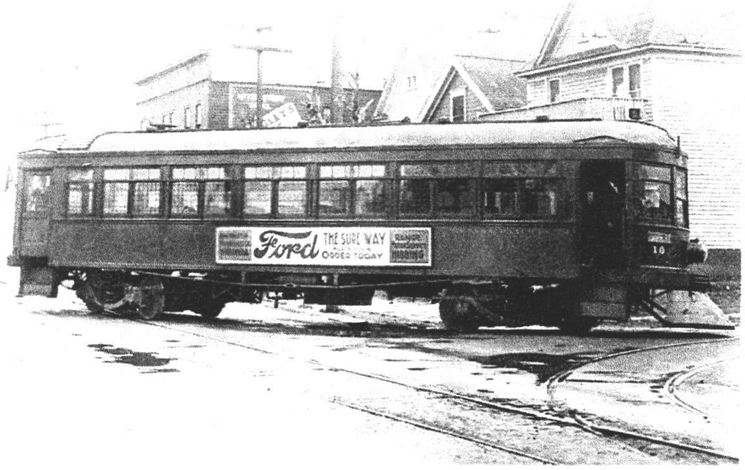
#19 LEAVING THE GILBERT WYE



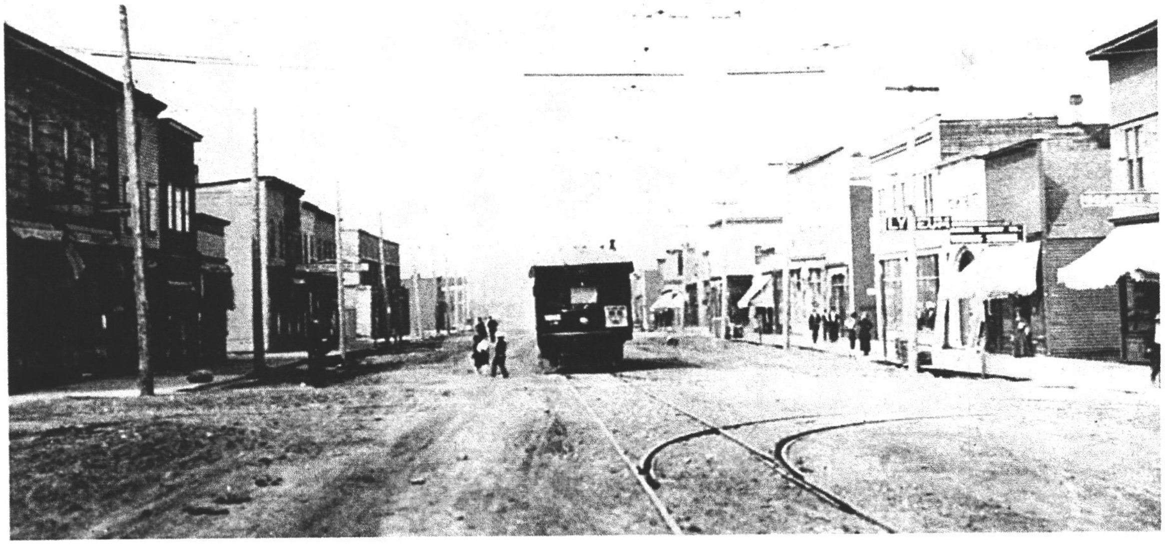
Note the signal contact shoe on the front truck of car 19. (Wayne C. Olsen collection)



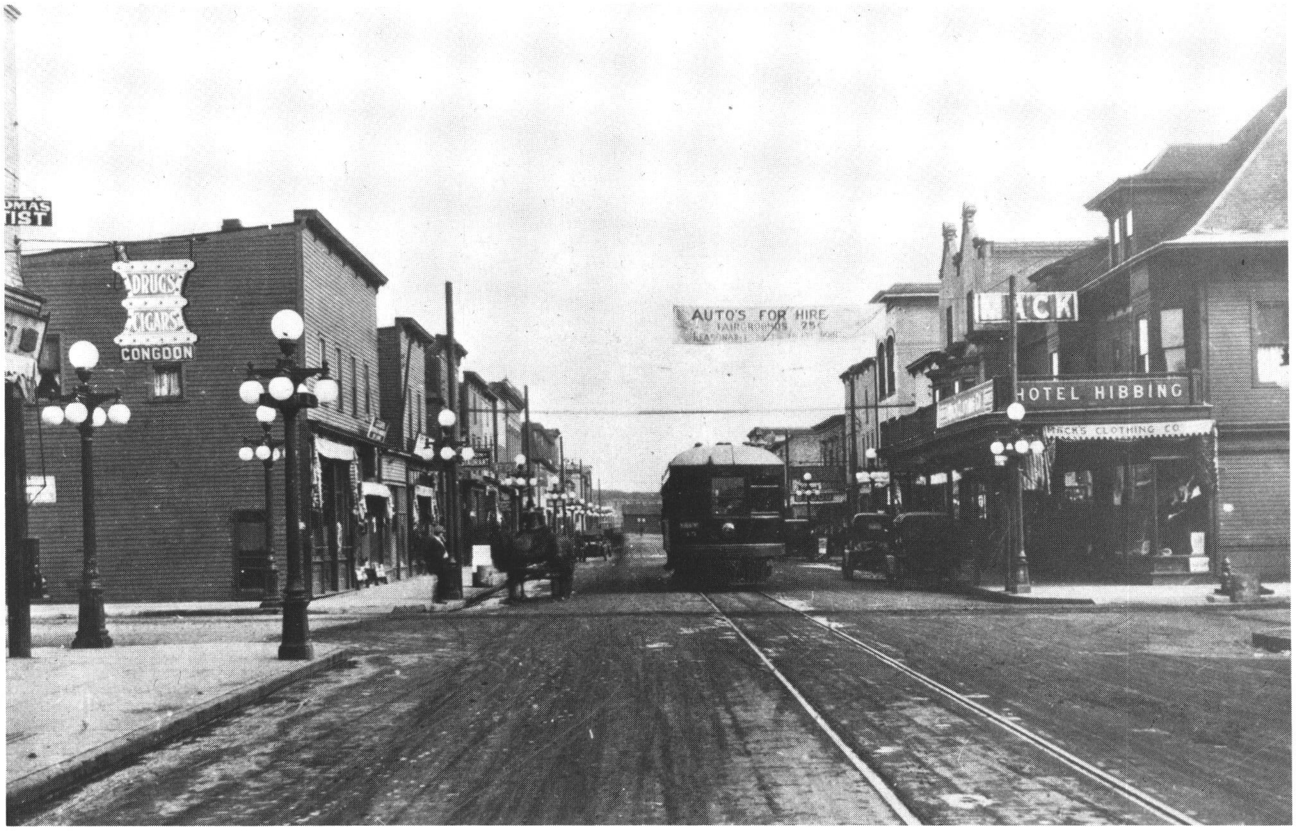
Northbound car on 3rd Ave. So., at 7th St., Virginia, on a wintry day during the first months of operation. (Wayne C. Olsen collection)

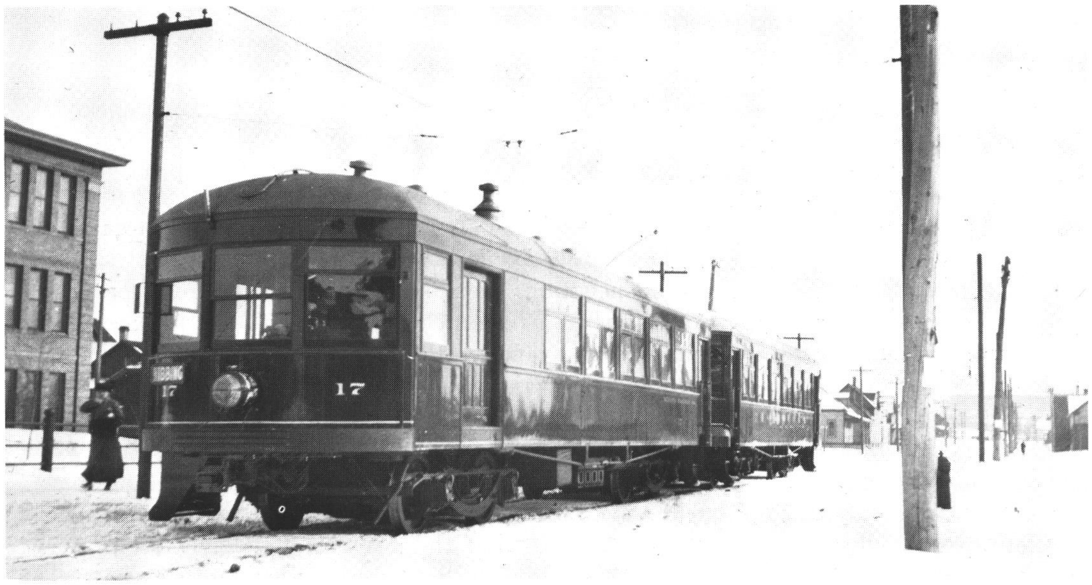


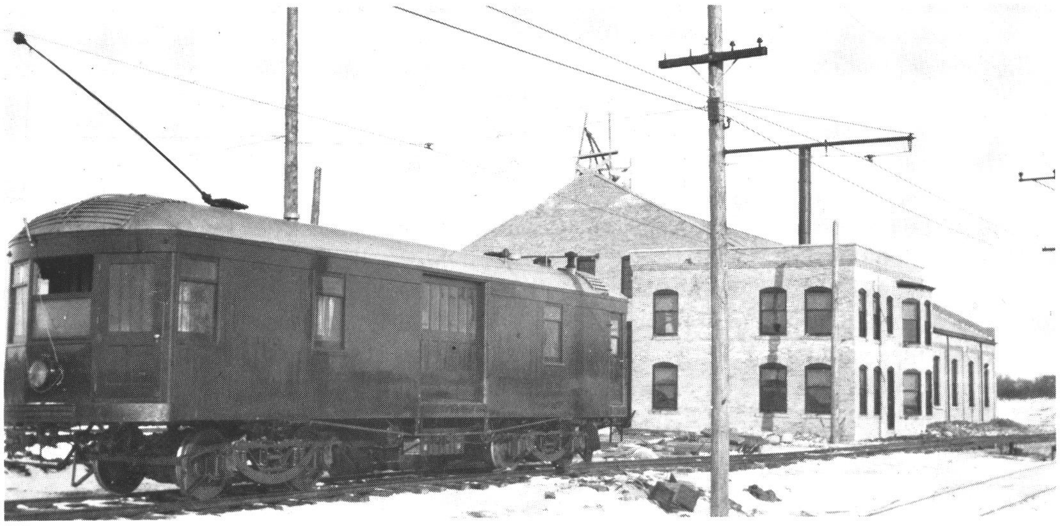
Passenger motor car 10 turning on the Virginia wye. The pilot has been covered with steel plate for snow plowing purposes, and advertising revenue has been solicited from the competition. (Russell Olson collection)



Above: Car 19 on Broadway at the Gilbert wye, ready to depart for Hibbing. The waiting station is in the frame building adjacent to the Lyceum Theater.


DRUGS
CIGARS
CONGDON
AUTO'S FOR HIRE
FAIRGROUNDS 25¢
MACK
HOTEL HIBBING
MACKS CLOTHING CO


HIBBING
17
17

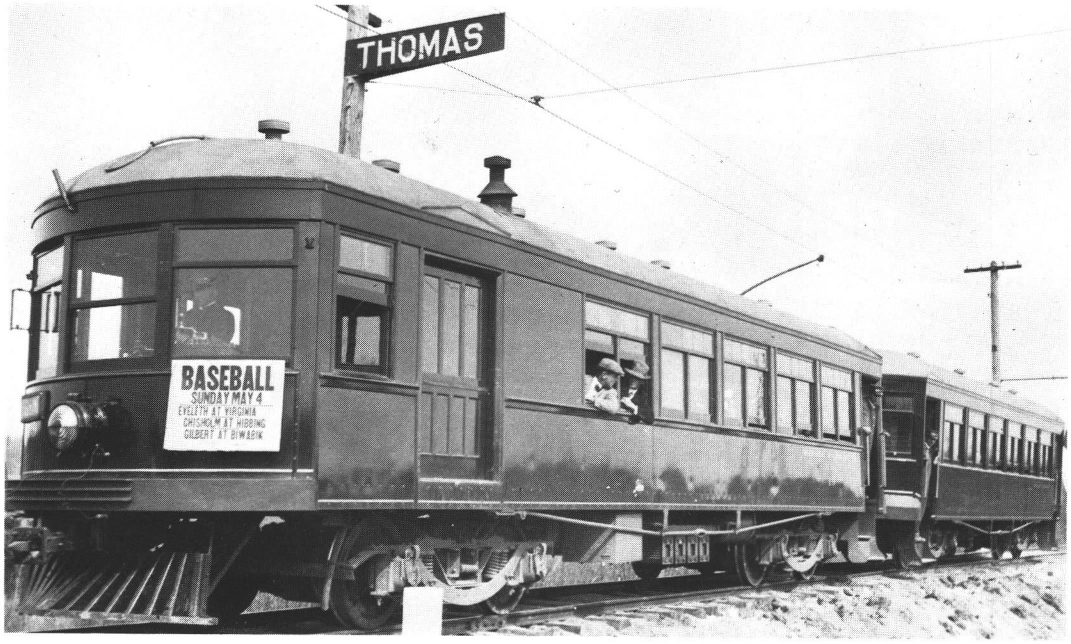


Above: Car 15 southbound on 3rd Ave. at Center or Cedar St., Hibbing, on the original line.

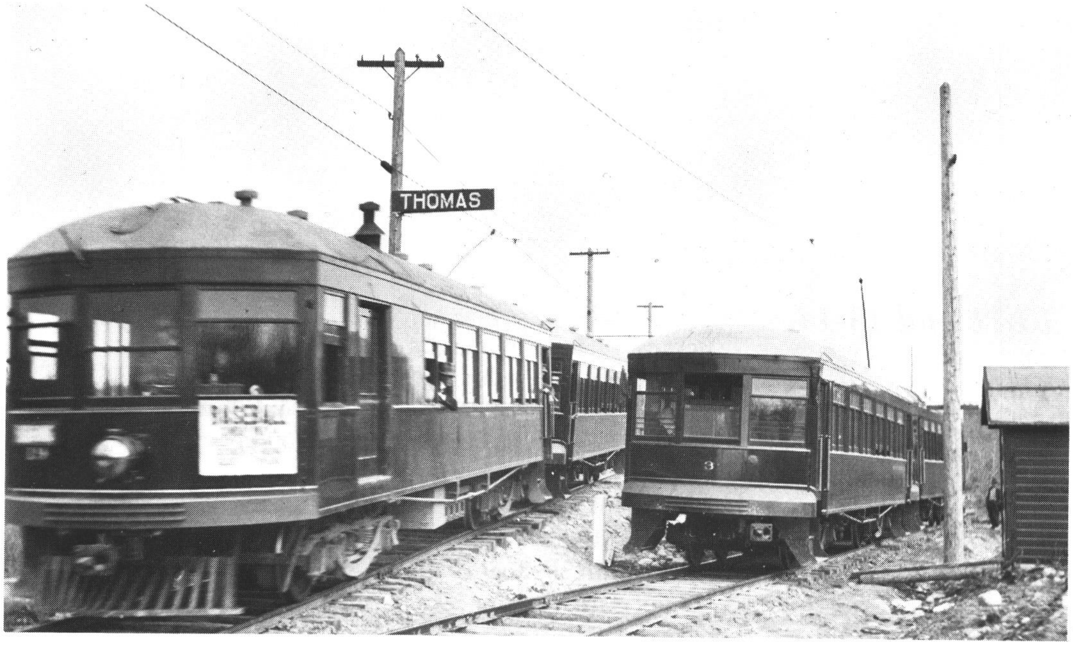
Center: Car 17 with trailer westbound on 3rd Ave. W. at 6th St., Virginia, in the early months of operation. The pilot has not yet been installed on the motor car.

Below: An express motor car newly received from the builder on the siding at the Virginia carhouse. Finishing touches are being placed on the carhouse building.

(All photographs Wayne C. Olsen collection)

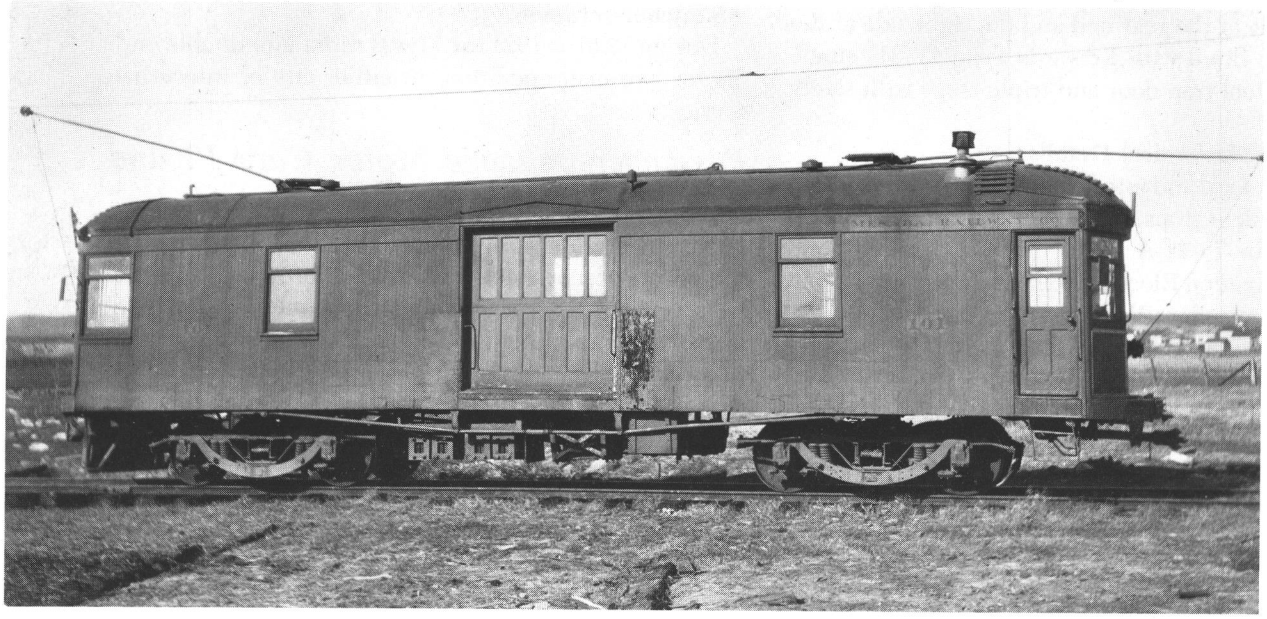

THOMAS
BASEBALL
SUNDAY MAY 4
EVELETH AT VIRGINIA
CHISHOLM AT HIBBING
GILBERT AT BIWABIK

Passenger-baggage motor car 19 with passenger trailer 2 westbound at Thomas siding, 1913.


THOMAS
BASEBALL
3

The same train in the foregoing photograph leaving Thomas siding after meeting the eastbound train. Note the white-painted clearance post between the main track and the siding, and the telephone booth to the far right.

(Both photographs Alex Ellison; Wayne C. Olsen collection)



Express motor car 101 at the Virginia carhouse after the end of operations in 1927. (Mesaba Ry.; Wayne C. Olsen collection)

EQUIPMENT

The initial equipment consisted of five passenger motor cars (10-14), five passenger-baggage motor cars (15-19), four passenger trailers (1-4), and two freight motor cars (101-102). All were built by the Niles Car & Manufacturing Co., Niles, Ohio, during 1912. The Duluth News Tribune of 8-16-1912 reported that the cars were exhibited at the American Electric Railway Association Convention in Chicago during October, then hauled as a special train to St.Paul where Great Northern Ry. took it over for delivery to Virginia. During 1913 one combination line car and snow plow (99) was received from the Wason Manufacturing Co., Springfield, Massachusetts. Also during 1913 three passenger trailers (5-7) were acquired second-hand to handle the unanticipated heavy passenger traffic.

The Virginia carhouse fire of 11-26-1913 destroyed passenger motor car 13, passenger-baggage motor cars 15-18, freight motor car 101, and passenger trailer 7. (The trucks from number 7 were salvaged.) The loss was entirely covered by insurance so identical replacements were ordered from Niles Car & Mfg. Co. for all of the cars, except passenger trailer 7 which was never replaced. These cars were received during March thru June 1914 and bore the same numbers as their predecessors. Cars 13,16-18 were listed as of steel construction, while 15 was of semi-steel construction.

About 2 a.m. on 4-9-1914 passenger motor car 12 was destroyed by fire caused by explosion of the hot-water heater. This loss was also covered by insurance so a replacement car was ordered from Niles Car & Mfg. Co. However second 12 was a passenger-baggage motor car.

During 1914 the company constructed two work-flat motor cars (200-201) in the Virginia shops. Passenger trailer 5 was converted into a parlor car during 1914; in 1920 it again became a regular passenger trailer.

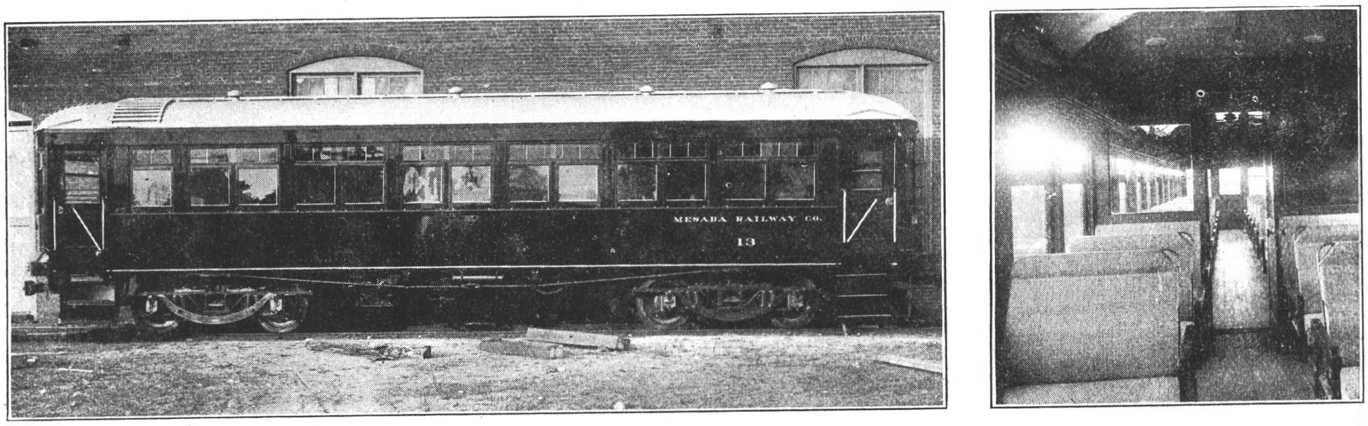
The original color scheme of the passenger cars was tan roof, dark green body and silver lettering. This was later changed to chrome yellow roof, dark red body, black trucks and underbody equipment. Roof color was subsequently changed to black.

Two passenger motor cars (32-33) were acquired second-hand during 1921 to operate the local service in Hibbing. These cars had a different color scheme.

During 1925 one-man operation of the cars was begun.

In May 1925 two of the passenger-baggage motor cars were badly damaged in a head-on collision between Virginia and Eveleth. They were never repaired and finally scrapped in 1926.

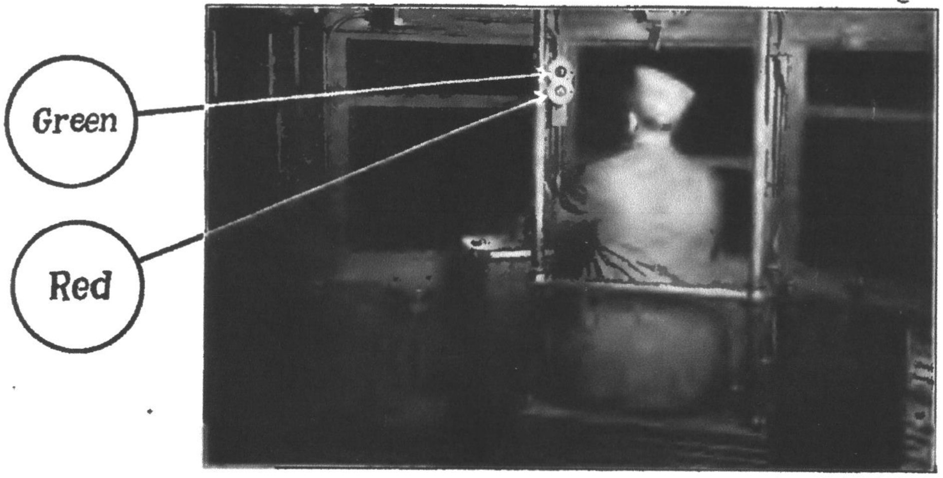
After the abandonment of rail service in April 1927 the company tried to sell the remaining cars to other railways, including Duluth St. Ry., but was unsuccessful. The trucks and motors (and presumably other electrical and mechanical equipment) were sold for scrap. Some of the carbodies were sold for various uses while the others were destroyed.



Mesaba Railway—Side View Passenger Motor Car—Interior View.

MESABA RAILWAY CO.							
EQUIPMENT							
		Passenger	Passenger	Express	Work	Work	Snow
Year Ended		Motors	Trailers	Motors	Motors	Trailers	Plows
6/30/1913		10	7	2		11	1
6/30/1914		9	6	2		13	1
12-31-1915 through							
12/31/1921		10	6	2	2	12	1
12/31/1922		12	6	2	2	12	1
12/31/1923	No report						
12-31-1924 and							
12/31/1925		12	6	2	2		1
12/31/1926		10*	6	2	2		1
		* Two cars wrecked in head-on collision					
McGraw Electric Railway							
Directory 1923		12#	6	2	1	13	1
		# Two cars one-man operated					

MESABA RY. CAB



EQUIPMENT SPECIFICATIONS

Passenger Motor Cars 10-11,13-14

Length over buffers 49'0", length over vestibules 47'2", length of car body 37'0", length of passenger compartment 25'7", length of smoking compartment 11'5", length of vestibules 5'0" each. Outside width 9'4". The underframe was of yellow pine reinforced with two 6" I beams under the platforms, ½" x 5" steel plates in the center sills, and two 5/8" x 7 3/4" steel plates in the side sills. Under and inside truss rods. 8" buffer plates and Hedby anti-climbers. Bodies had double maple floors, double side walls sheathed outside with 1/8" x 34" steel plate, and removable storm sash for the windows. Each side of the body at the rear end and the right side at the front end were fitted with Edwards Type 4V 31" single swing-doors, steel trap door and triple steps with safety treads.

Designed for local and interurban service with medium speed and frequent stops. Maximum speed was about 45 m.p.h. Baldwin 78-22-A trucks (36" cold-rolled steel wheels), four General Electric 201H (60 h.p.) motors and one K-35-G controller. Westinghouse combination automatic and straight air brake system with D-2 air compressor. Tomlinson Auto-Radial couplers. Trailer air connections, light and heating cable connections were at the rear of each car. Union Standard Type 13 trolley base, 14 ft. Shelby Style A trolley pole, 6" diameter trolley wheel, and Knutson #5 catcher-retriever. Weight of the car complete was 48,400 lbs.

Because a large percentage of the passengers were mine workers with soiled clothing, the interior finish was of dark oak with light blue ceiling. Hale & Kilburn rattan seats with fixed backs provided seating for 50 persons. Toilet with dry hopper located in the passenger compartment. Peter Smith hot-water heater located in the front vestibule with an all-steel coal bunker alongside. Ohmer fare register located in the passenger compartment.

During 1920 or 1921 number 11 was rebuilt for double-end, one or two-man operation, in either city or interurban service.

Passenger-Baggage Motor Cars 12,15-19

Details are identical to those listed for the Passenger Motor Cars except for the following differences. Length of front vestibule and baggage compartment 9'6", length of smoking compartment 9'8", length of passenger compartment 23'0", and length of rear vestibule 5'0". Each side of the baggage compartment was fitted with a 3'6" sliding door. Seating capacity was 44 persons. Peter Smith hot-water heater located in the baggage compartment.

Passenger Trailers 1-4

These cars were designed for double-end operation with two compartments, passenger and smoking. Length over buffers 45'0". Outside width 9'4". Underframe construction was identical to that on the motor cars. Each corner of each end had Edwards 31" single swing-doors, steel trap door and triple steps. Each end bulkhead had a 30" single swing-door and the smoking compartment bulkhead had a 23" single swing-door. Other details are identical to the motor cars.

Baldwin 78-22-A trucks. Westinghouse air brakes. Tomlinson Auto-Radial couplers and air, light and heating cable connections at each end. Weight complete was about 36,000 lbs.

Hale & Kilburn reversible back rattan seats. Toilet with dry hopper located in passenger compartment. Ohmer fare register. Consolidated electric car heaters.

Freight Motor Cars 101-102

Length over buffers 46'0", length over body 43'4", inside length for freight 35'0". The underframe was constructed of yellow pine reinforced with two 6" steel I beams in the center sills and two 5/8" x 7 3/4" steel plates in the side sills. The body had a 1 3/4" hard maple plank floor, 6'0" sliding freight door in each side, swing-door in each end for loading long articles, and motorman's swing-door in right side of each end. A 5-ton capacity chain hoist and boom was provided for picking up heavy freight from station platforms.

Baldwin 78-22-A trucks, four General Electric 201H motors, and two K-35-G controllers for double-end operation. Westinghouse combination straight and automatic air brakes. Weight complete was about 54,000 lbs.

Passenger Trailer 5

Built by the McGuire-Cummings Mfg. Co. at at unknown date. Length over buffers 50'2", length of passenger compartment 25'0", length of smoking compartment 15'0", and length of vestibules 5'0" each. Edwards trap doors were used.

McGuire-Cummings MC 101 trucks. Westinghouse Type AMM air brake system. Tomlinson Auto-Radial couplers.

Seating capacity 56 persons. One dry-hopper toilet. Ohmer fare register. Consolidated electric car heaters.

Passenger Trailers 6 and 7

J. O. Bergerson's notebook had no information on car 7 which was destroyed in the 11-1913 carhouse fire. Edward B. Watson of New York City believes these two cars originally came from the New York & Brooklyn Bridge Railroad. He states similar cars 45 and 62 were built by the Pullman Company in 1886 and probably sold sometime after 1900 but by 1907-1908. The company ceased operation 1-27-1908. Bergerson's specifications for number 6 follow.

Built by the Pullman Company, Detroit, Michigan, at an unknown date. Length over buffers 50'6", length of passenger compartment 39'0", and length of open end platforms 4'0" each. McGuire-Cummings MC 101 trucks. Westinghouse Type AMM air brake system. Passenger compartment fitted with longitudinal sectional seats for a capacity of 46 persons.

Line Car-Snow Plow 99

Length 33' or 38'. Width 7'6". Equipped for double-end operation with manual and air-operated snow plows. Four General Electric 201H motors. Westinghouse Type AMM air brake system. Tomlinson couplers.

Work Flat Motor Cars 200-201

Length over buffers 40'10". Width 9'6". Baldwin 78-22-A trucks. Westinghouse air brakes for train service. Maximum load was about 48,000 lbs.

415 E. 52 ST.
New York, N.Y. 10022
May 19, 1977

Dear Mr. Olson,

I enjoyed your "Electric Railways of Minnesota" very much - It's a good book and a great addition to the Transportation history of our country.

Possibly I can clear up one unknown section of your roster - namely pages 465 + 466 of the section on the Mesaba Railway Co.

You have lots of Trailers 6 + 7 in pictures. These 2 cars originally came from the New York + Brooklyn Bridge Railroad, formed in 1883 to carry people across the bridge. Cable was used crossing the bridge - steam at each end for switching until cars were electrified - for switching only.

Enclosing 2 views of the sister cars of the 2 Trailers. These cars were either scrapped or sold by 1907. 3 of them went to Mason City + Clear Lake - see page 266 in Bulletin 114 of the CERA - 1975.

Cars 45 + 62 were built by Pullman in 1886 + probably sold sometime after 1900, but by 1907-08.

There is a good story of the N.Y. + B.B. operation in Bulletin 97, of Oct 1957, of the Railway + Locomotive Hist. Society.

Hope this helps a bit in the all over story -

Cordially

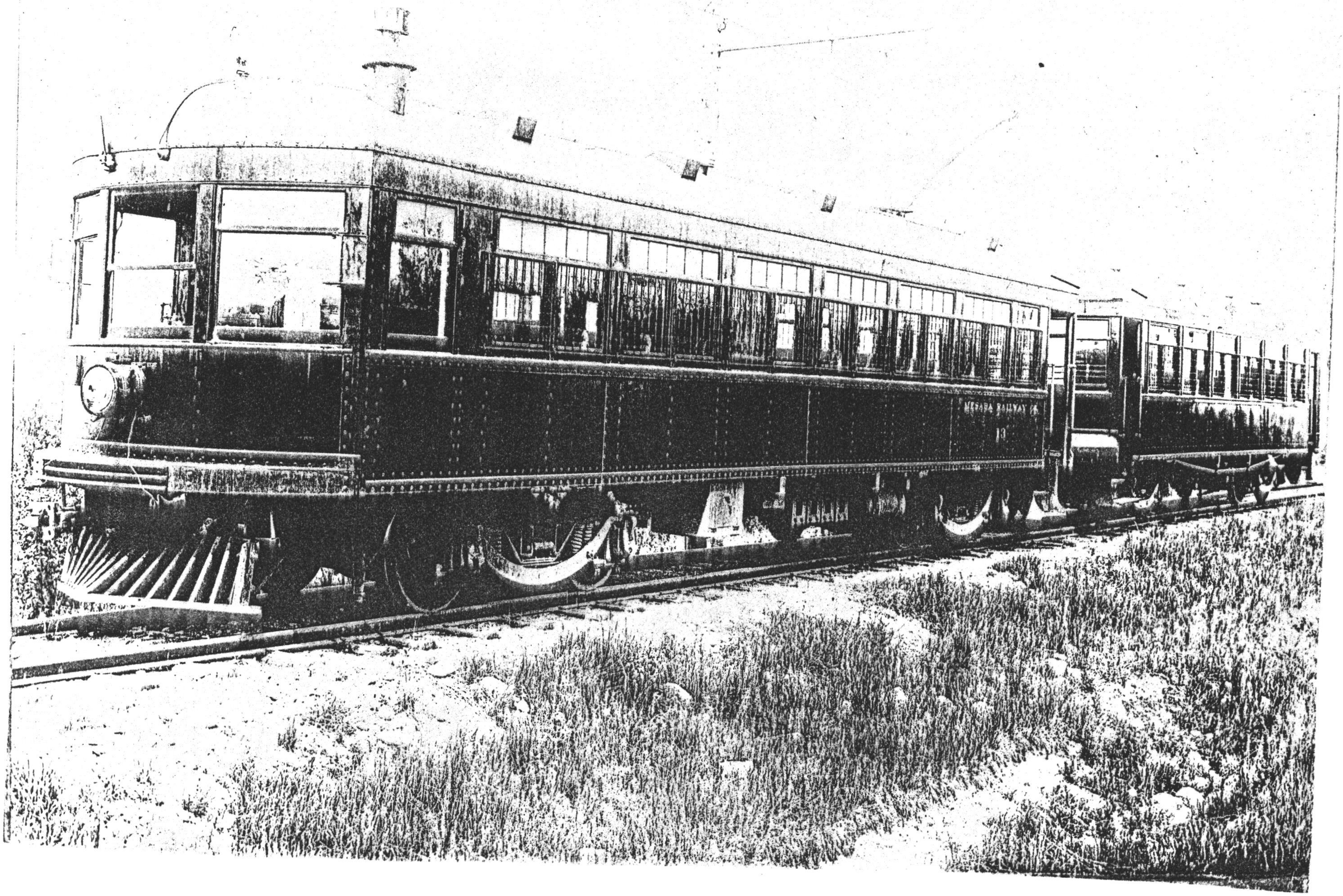
Edward B. Watson

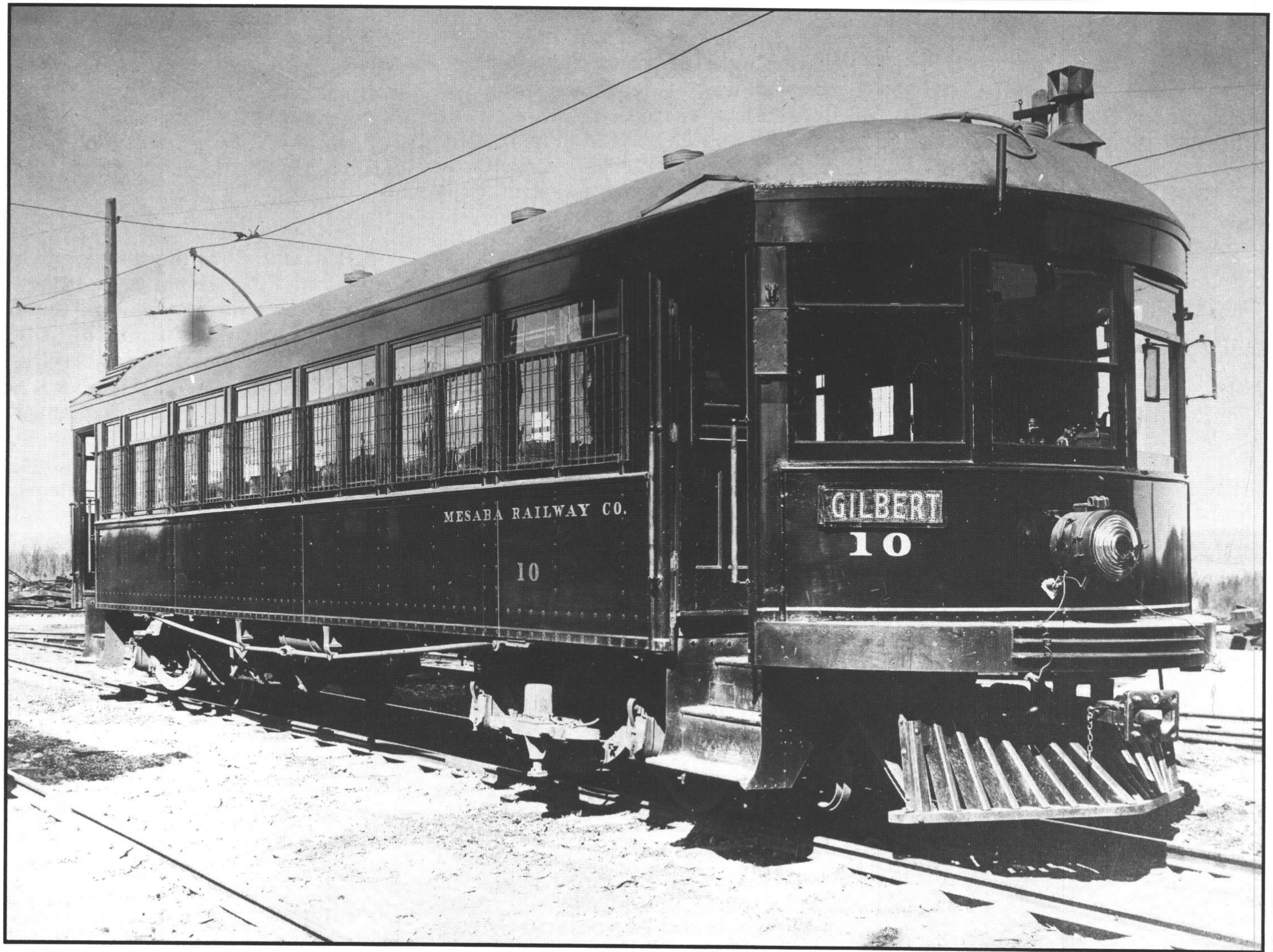
Pres. Branford Electric Ry Assoc. + Museum
in East Haven - Branford, Ct.

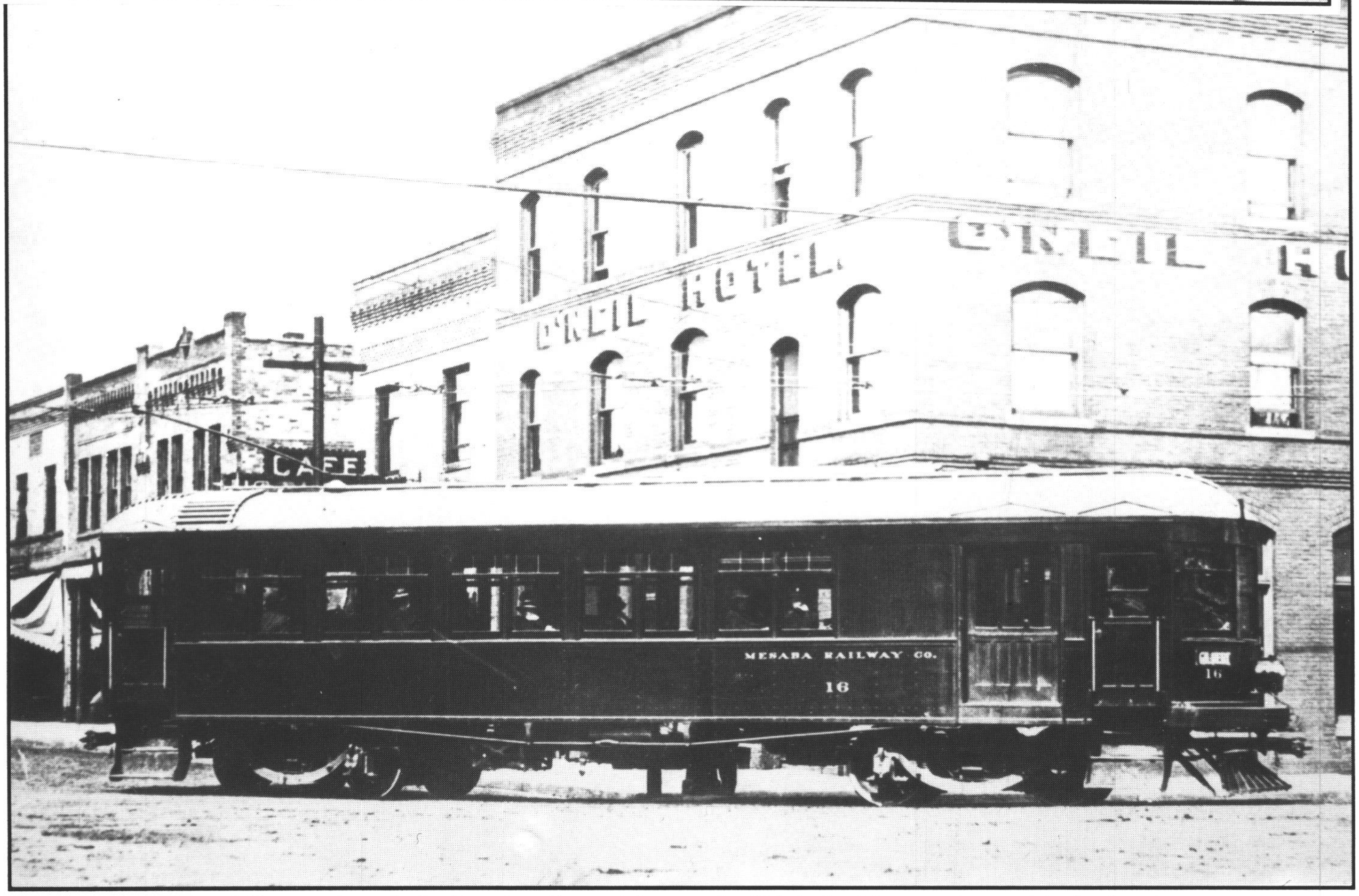
P.S. - These 2 prints are yours.

ceased operation
1-27-1908

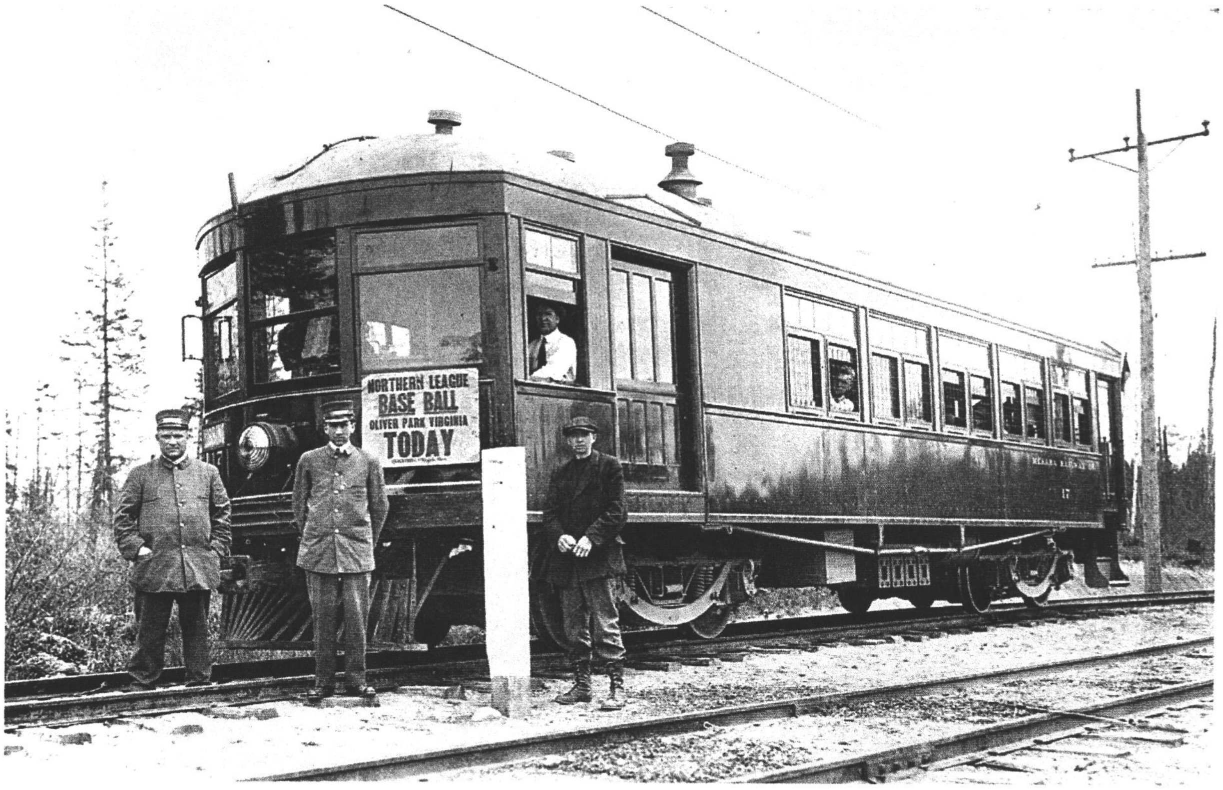
#13 and #3


MESABA RAILWAY CO.
13


GILBERT
10
MESABA RAILWAY CO.
10


O'NEIL HOTEL
O'NEIL HOTEL
CAFE
MESABA RAILWAY CO.
16
GILBERT
16

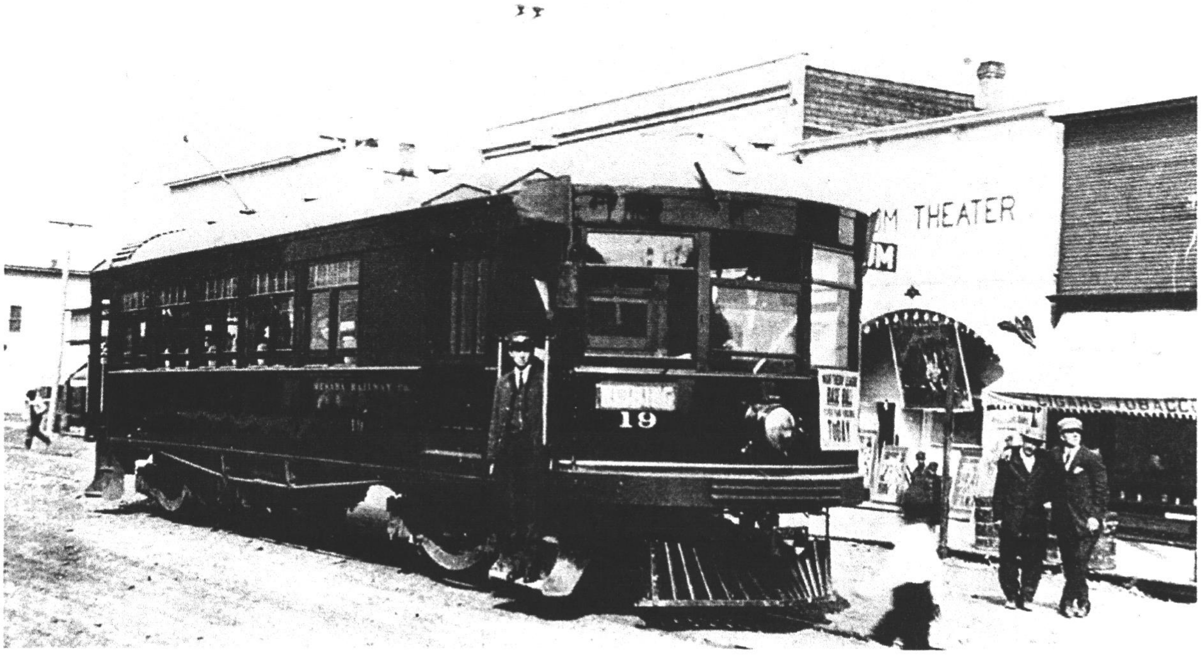
Eastbound combine #16 turns from Lake Street to Central Avenue in Chisholm. The wye is one block ahead.

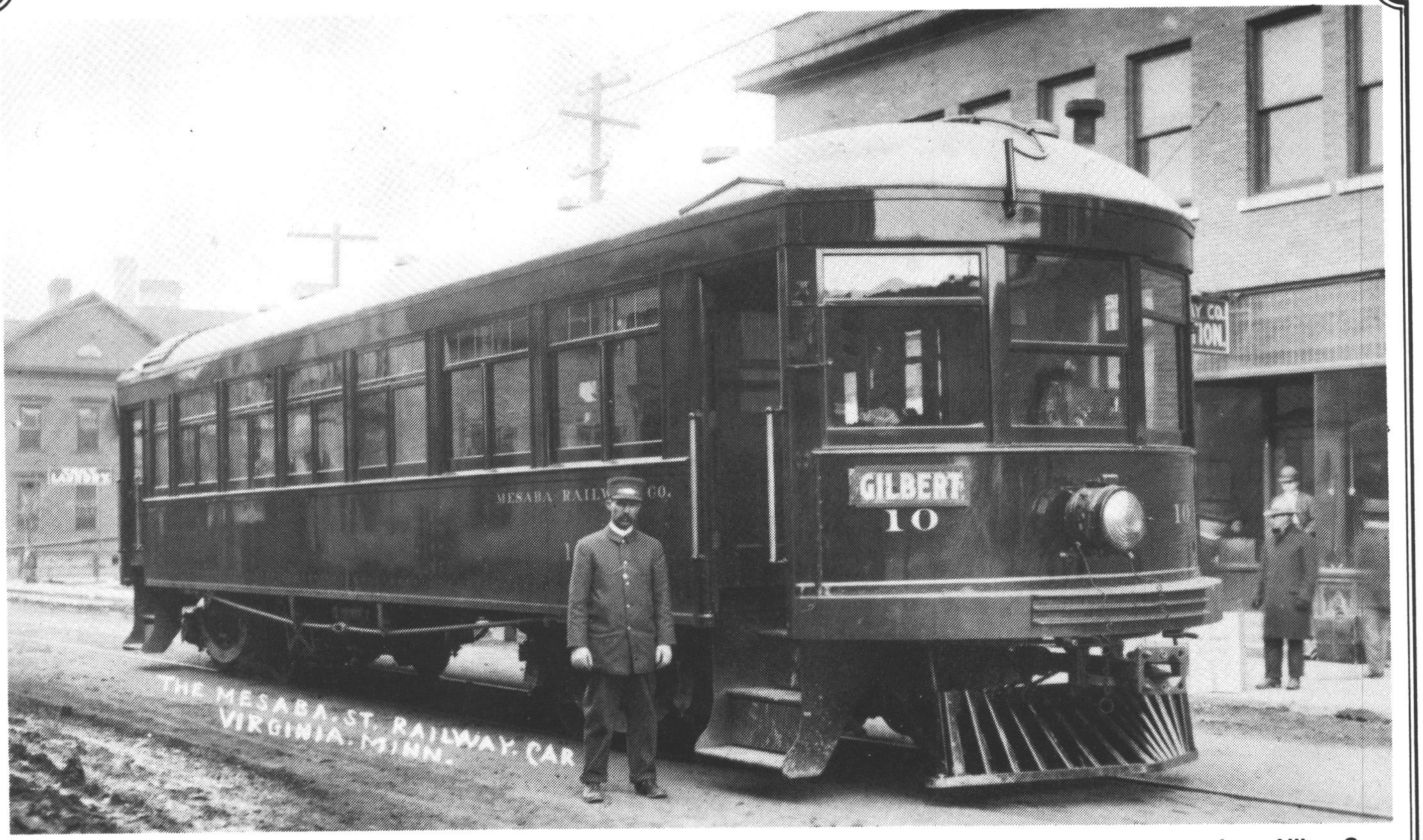

NORTHERN LEAGUE
BASE BALL
OLIVER PARK VIRGINIA
TODAY
17

Mesaba Ry. 17 on a siding at an unidentified location. (Wayne C. Olsen collection)

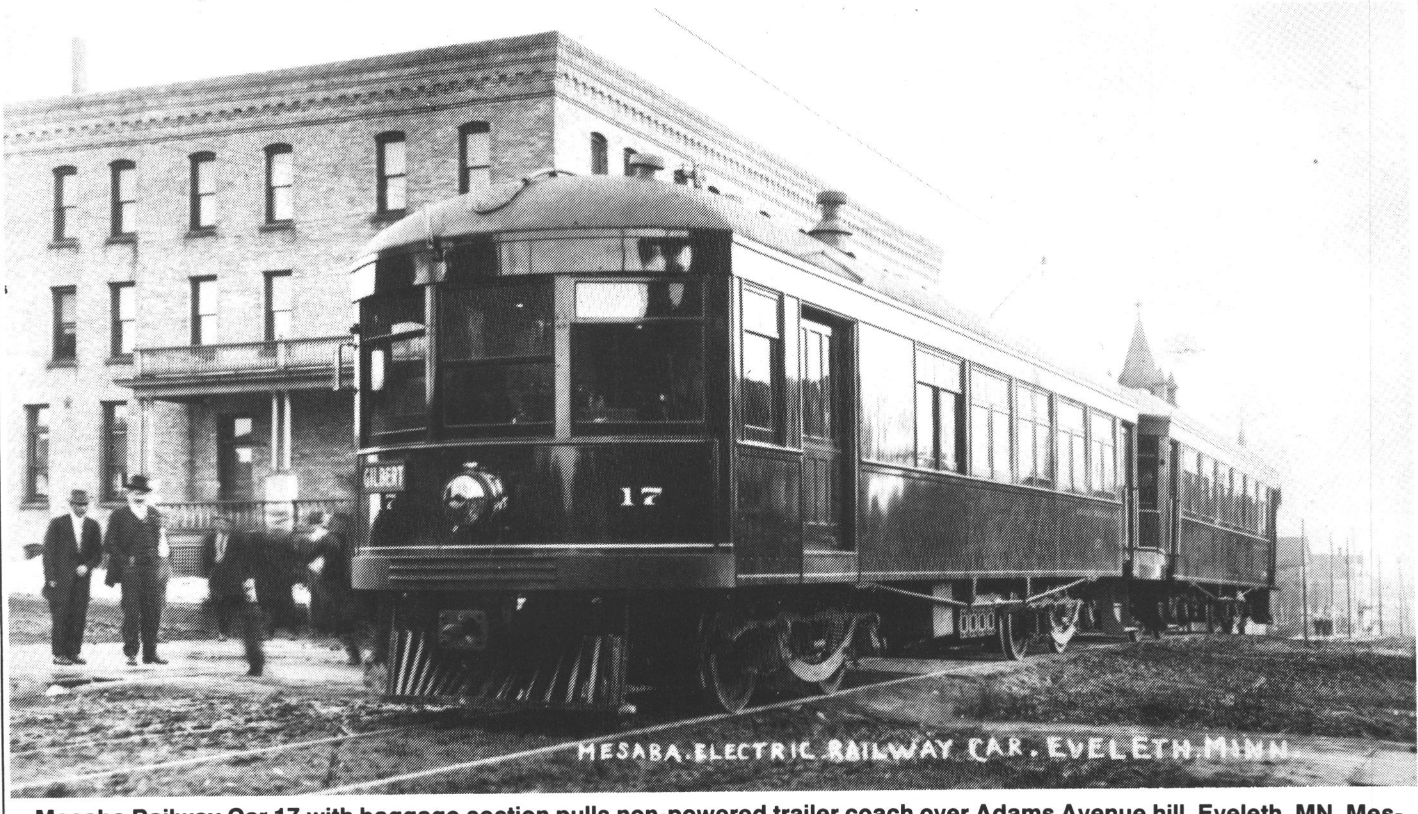
Below: Another view of car 19 loading passengers from the street in front of the Gilbert waiting station.

(Both photographs Wayne C. Olsen collection)

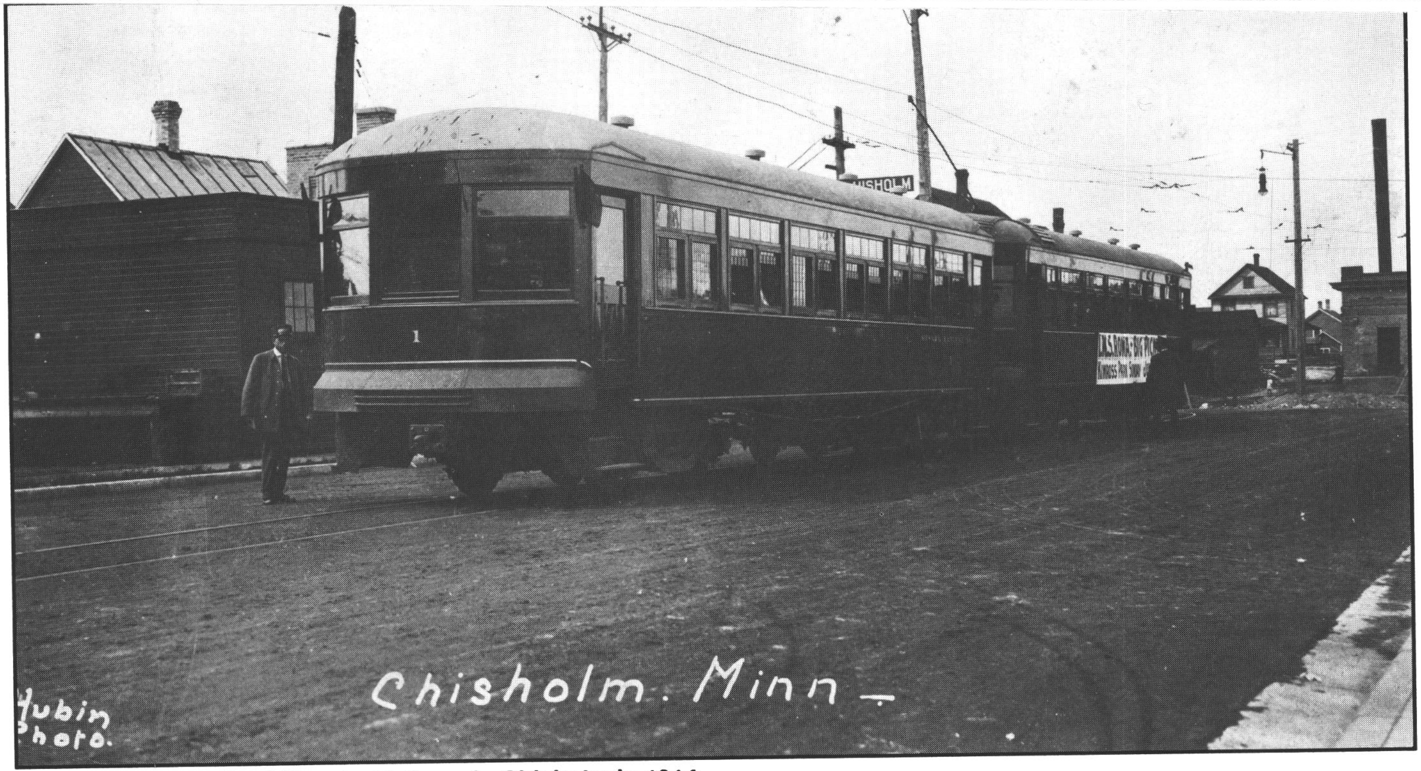

M THEATER
19
CIGARS TOBACCO


GILBERT
10
MESABA RAILWAY CO.
THE MESABA. ST. RAILWAY. CAR
VIRGINIA. MINN.

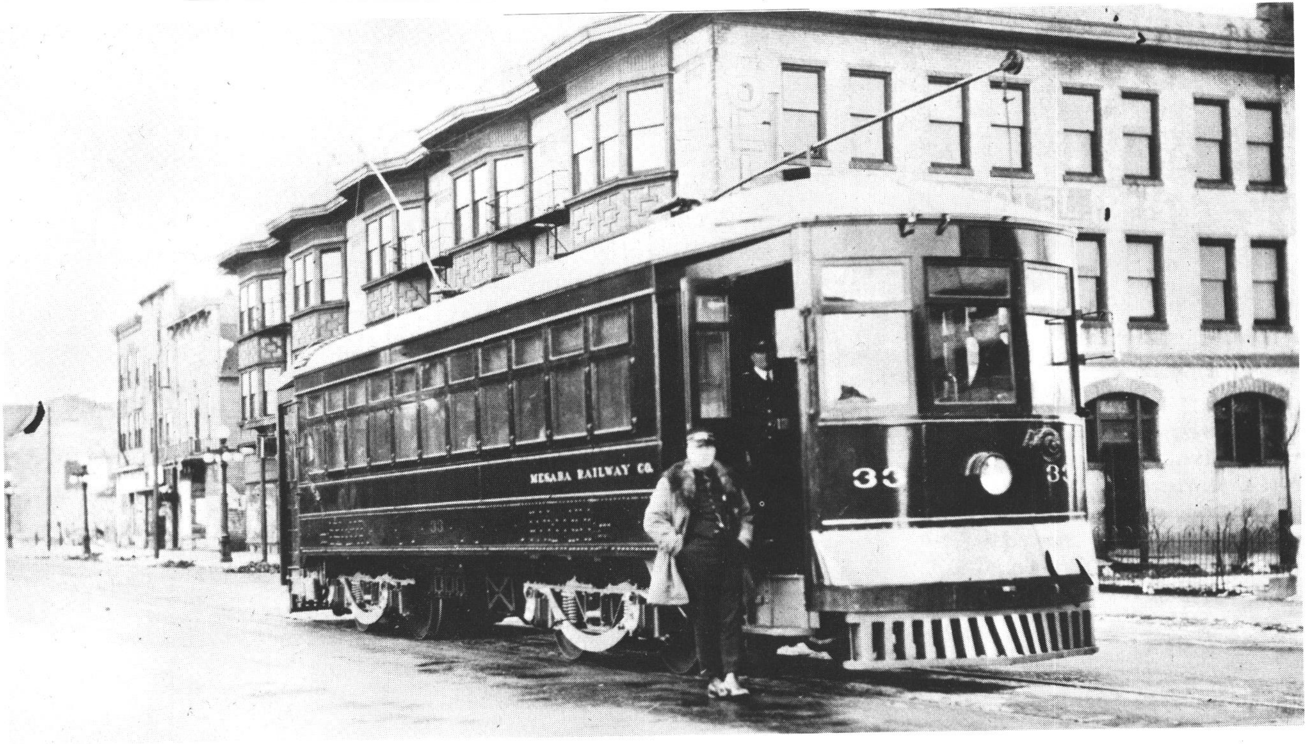
Handsome interurban car No 10 of Mesaba Railway on Broadway, Gilbert, MN, soon after 1913 delivery from Niles Car Company. Note rapid transit style coupler below headlight. With controls only in front, cars turned on wye between runs. Today in MTM's collection, No 10 contains forward smoking section with toilet, and coal-burning hot water heater in motorman's cab against bracing Iron Range winters. Bill Everitt Postcard Collection Courtesy Of Ken Fletcher.

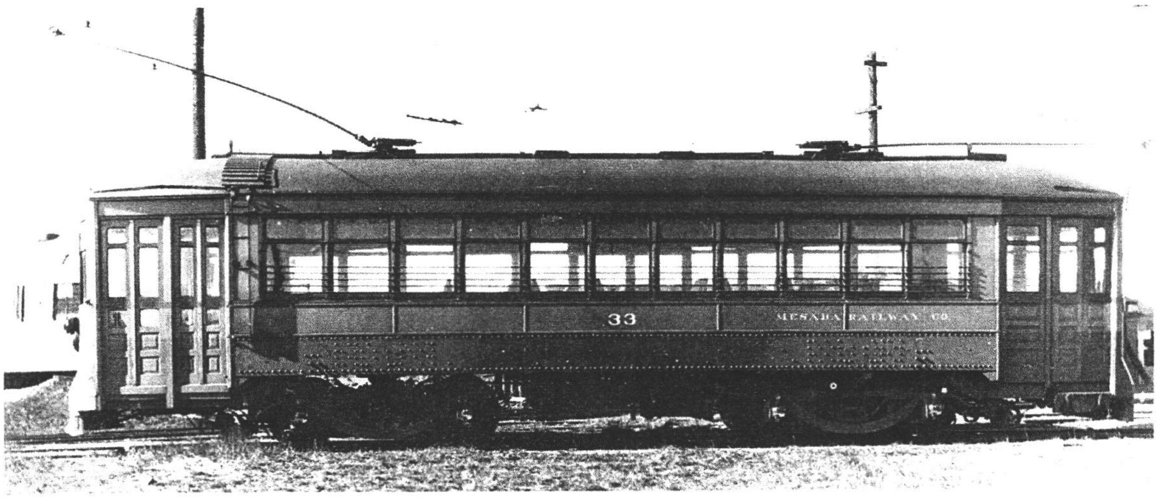

GILBERT
17
MESABA. ELECTRIC RAILWAY CAR. EVELETH. MINN.

Mesaba Railway Car 17 with baggage section pulls non-powered trailer coach over Adams Avenue hill, Eveleth, MN. Mesaba operated interurban service from Hibbing to Gilbert, via Chisholm, Buhl, Mountain Iron, Virginia and Eveleth. Abandoned in 1927. Ken Fletcher Collection.


CHISHOLM
1
Chisholm. Minn.
Hubin Photo.

Above: The short-lived Mesaba Railway in Chisholm in 1914.


MESABA RAILWAY CO.
33


33
MESABA RAILWAY CO.

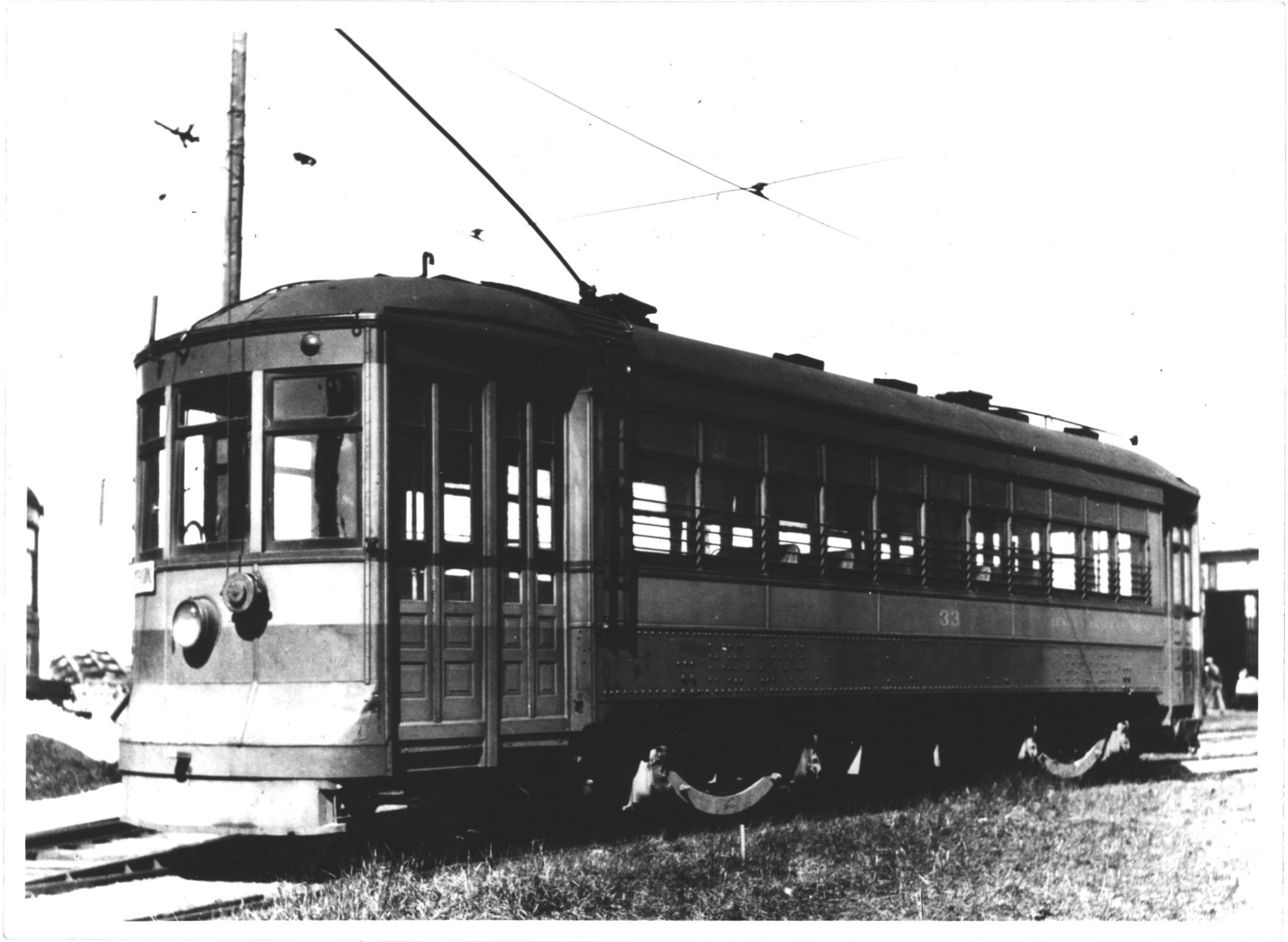
Dump Trailers

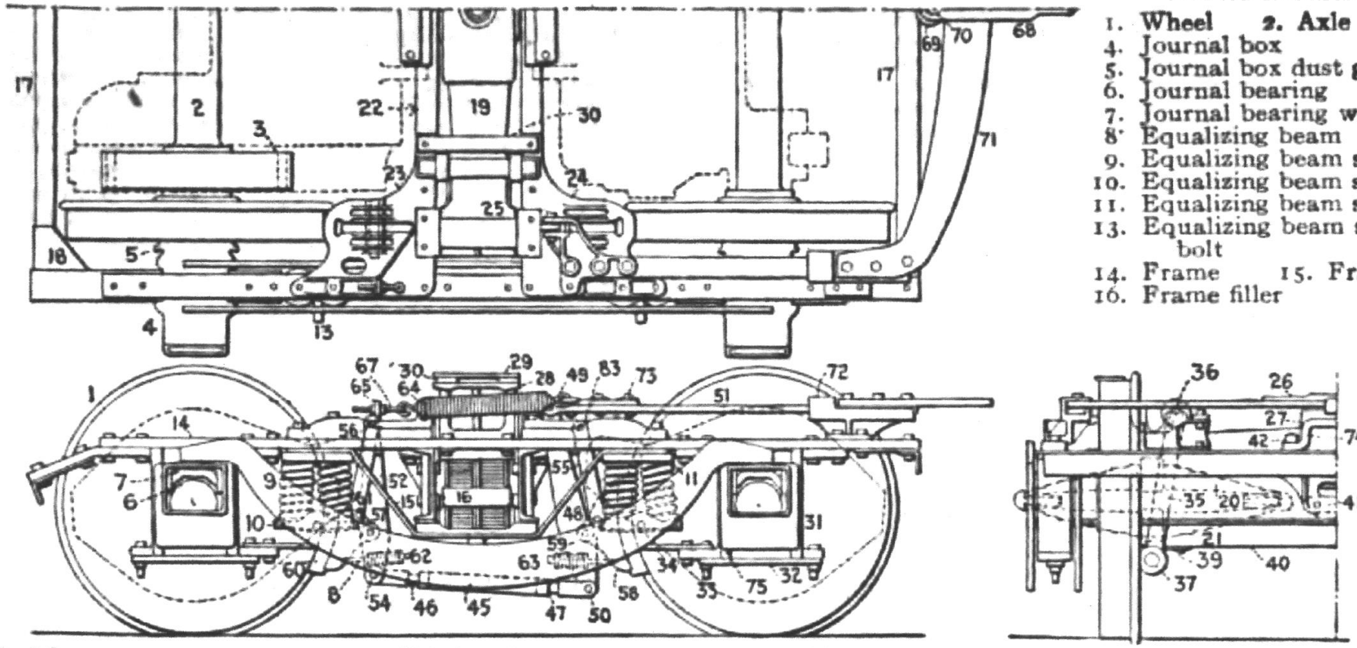
A number of four-wheel side-dump trailers, apparently mine earth-stripping cars, were acquired second-hand for use in constructing the railway. All weighed 3,800 lbs. each. The quantity was reported at various times as 11, 12 or 13 cars. All were ordered scrapped in December, 1917, but continued to be listed in equipment reports until 1924.

City Passenger Motor Cars 32-33

These two cars were purchased in 1921 from the Washington-Virginia Railway of Washington D.C. This company had acquired additional cars during 1918 in anticipation of increased service required by the war emergency plus construction of a line extension to an army fort. These acquisitions included three new cars built by the McGuire-Cummings Mfg. Co. in 1917 as part of an order for the Chicago & West Towns Railway, purchased in 1918. Two were motor cars, #32 and #33, equipped with McGuire-Cummings 10B4 trucks, four G.E. 226A (?) motors, and K-35 controllers. The third identical car, without motors or controllers, was trailer #120. The war emergency was over in 1918 and the line extension was never constructed so many of these additional cars had to be sold to ease the company's financial distress. #32 and #33 were sold in 1921 to the Mesaba Railway Company.

Length over buffers 45'0", length of passenger compartment 31'0", length of vestibules 6'0" each. Width 8'8". The bodies were sheathed on the outside with 1/8" steel plate and were provided with storm sash. Doors and folding steps were manually operated. Baldwin 78-22-A trucks, four G.E. 201H motors, and two K-35-G controllers for double-end operation. Westinghouse straight air brakes with a D-2-ET air compressor. Weight complete about 50,000 lbs. Seating capacity 40 persons. Cleveland fare boxes and International Fare Registers both were used. Consolidated electric car heaters were located under the seats and in both vestibules, with double-coil panel heaters under the longitudinal seats.




17
2
3
22
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30
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69
70
68
71
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4
13
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14
67
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65
64
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83
73
72
51
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37
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Names of Parts

1. Wheel 2. Axle 3. Gear
4. Journal box
5. Journal box dust guard
6. Journal bearing
7. Journal bearing wedge
8. Equalizing beam
9. Equalizing beam spring
10. Equalizing beam spring seat
11. Equalizing beam spring cap
13. Equalizing beam spring seat bolt
14. Frame 15. Frame truss
16. Frame filler

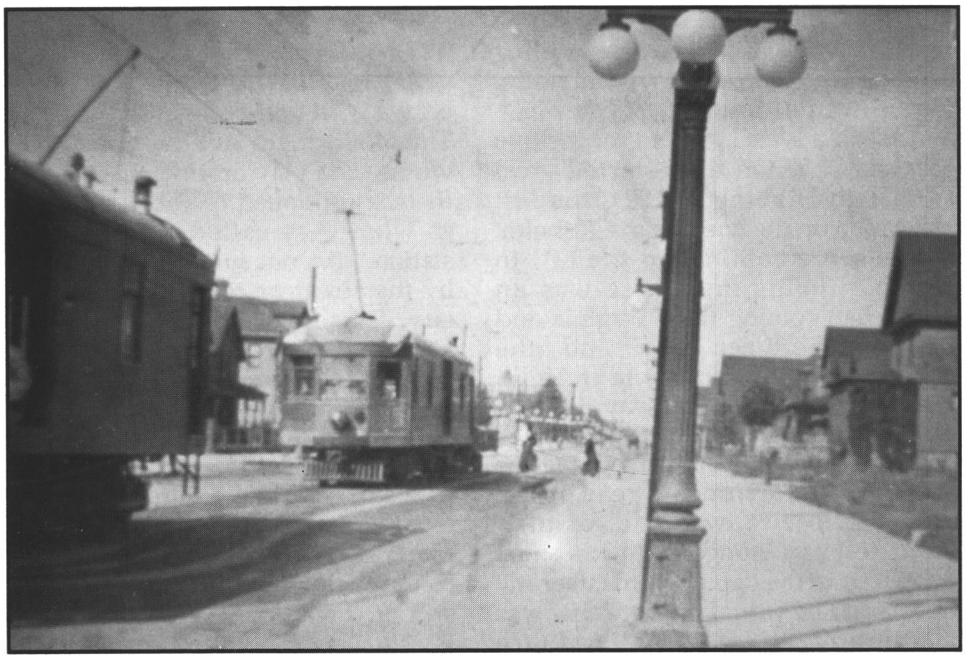
17. End frame
28. End frame gusset
19. Bolster
10. Bolster spring 22. Transom
23, 24. Transom gussets
25. Transom chafing plate
26. Carbody center plate
27. Truck center plate
28. Side bearing

29. Side bearing plate
30. Side bearing shims
31. Pedestals 32. Pedestal cap
33. Pedestal cap bolt and nut
34. Pedestal brace
35. Swing link
39. Swing link pin bearing'
40. Spring plank
41. Motor suspension bracket

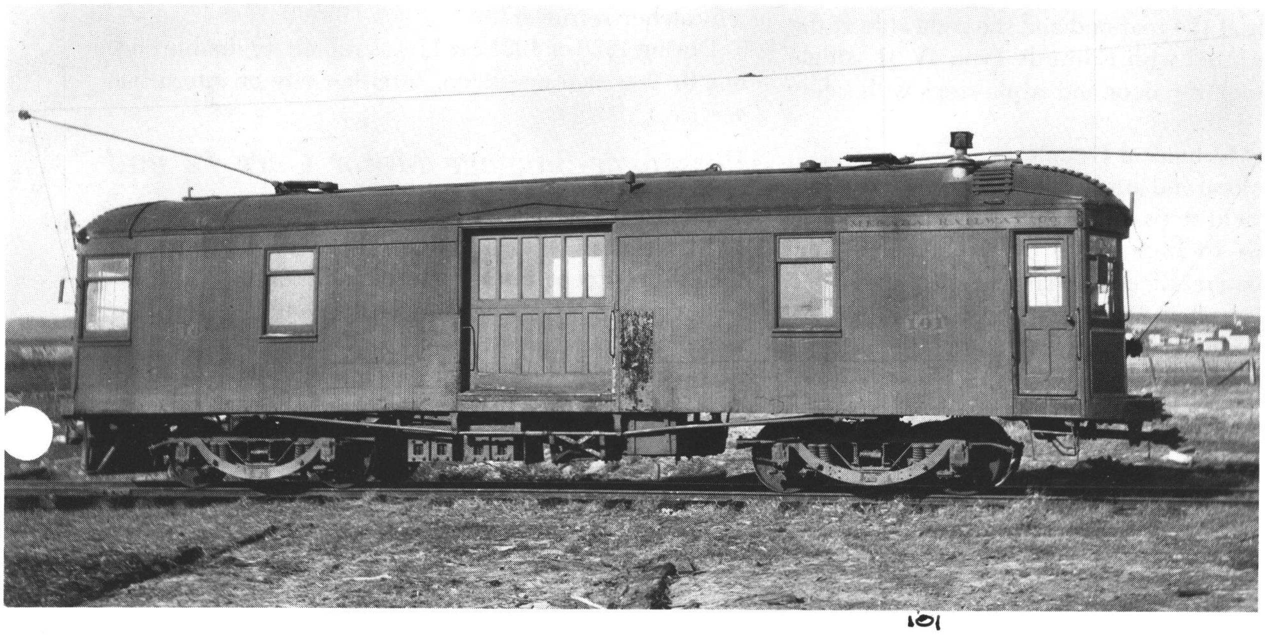
42. Motor suspension bolt
45. Brake turnbuckles
48. Brake live lever
51. Brake live lever rod
52. Brake dead lever
55. Brake hanger
58. Brake head
60. Brake shoe
61. Brake shoe key

62. Brake shoe adjusting spring
64. Brake release spring
68. Brake pull rod jaw
69. Brake pull rod roller
71. Radial brake beam
72. Radial brake beam guide
73. Brake live lever rod jaw
74. Motor suspension strap
75. Pedestal gib

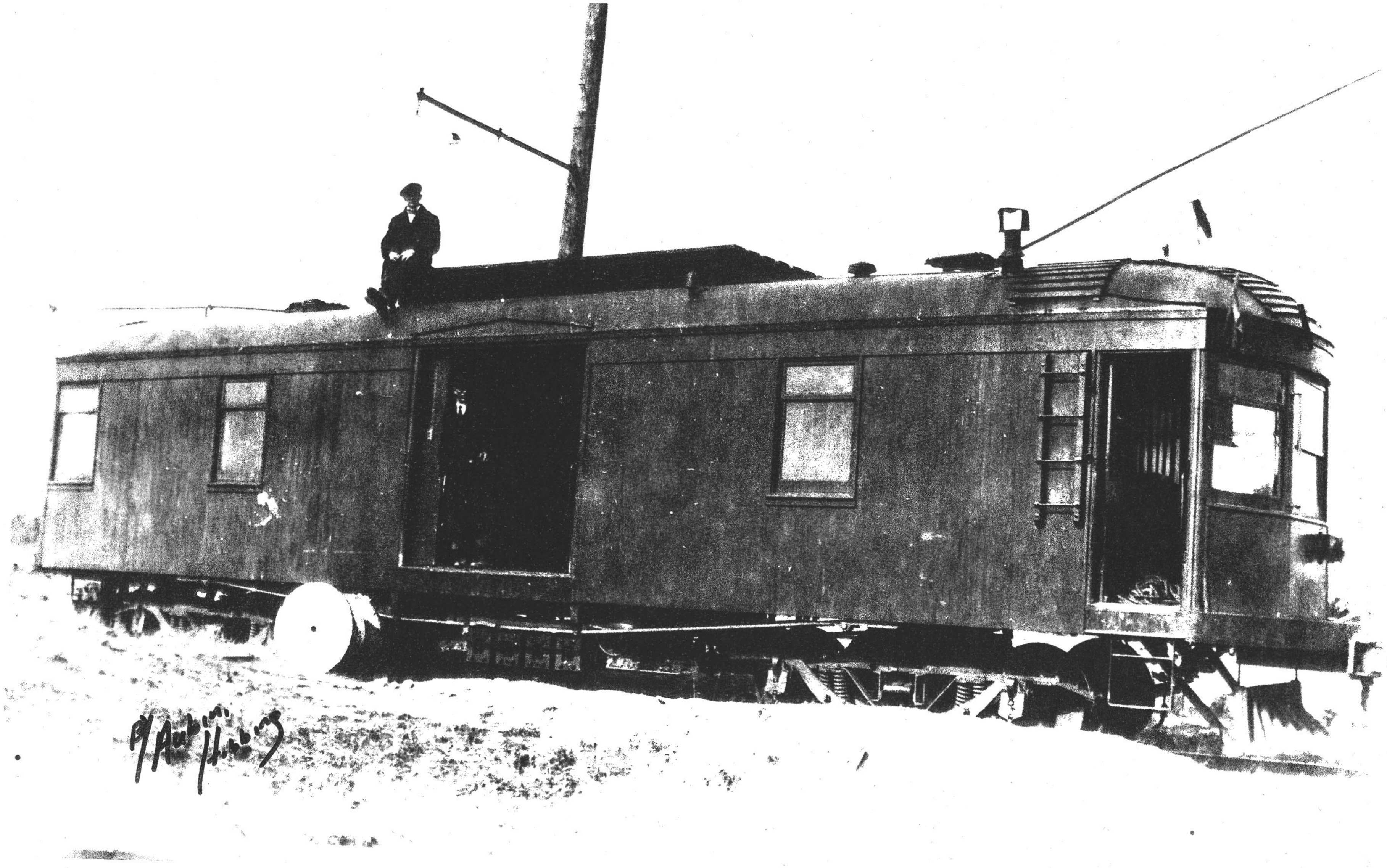
Fig. 6.—Baldwin Locomotive Works type A double truck.



Although blurred, this photo is rare because it shows both of the Mesaba express motors on 3rd Ave. in North Hibbing.

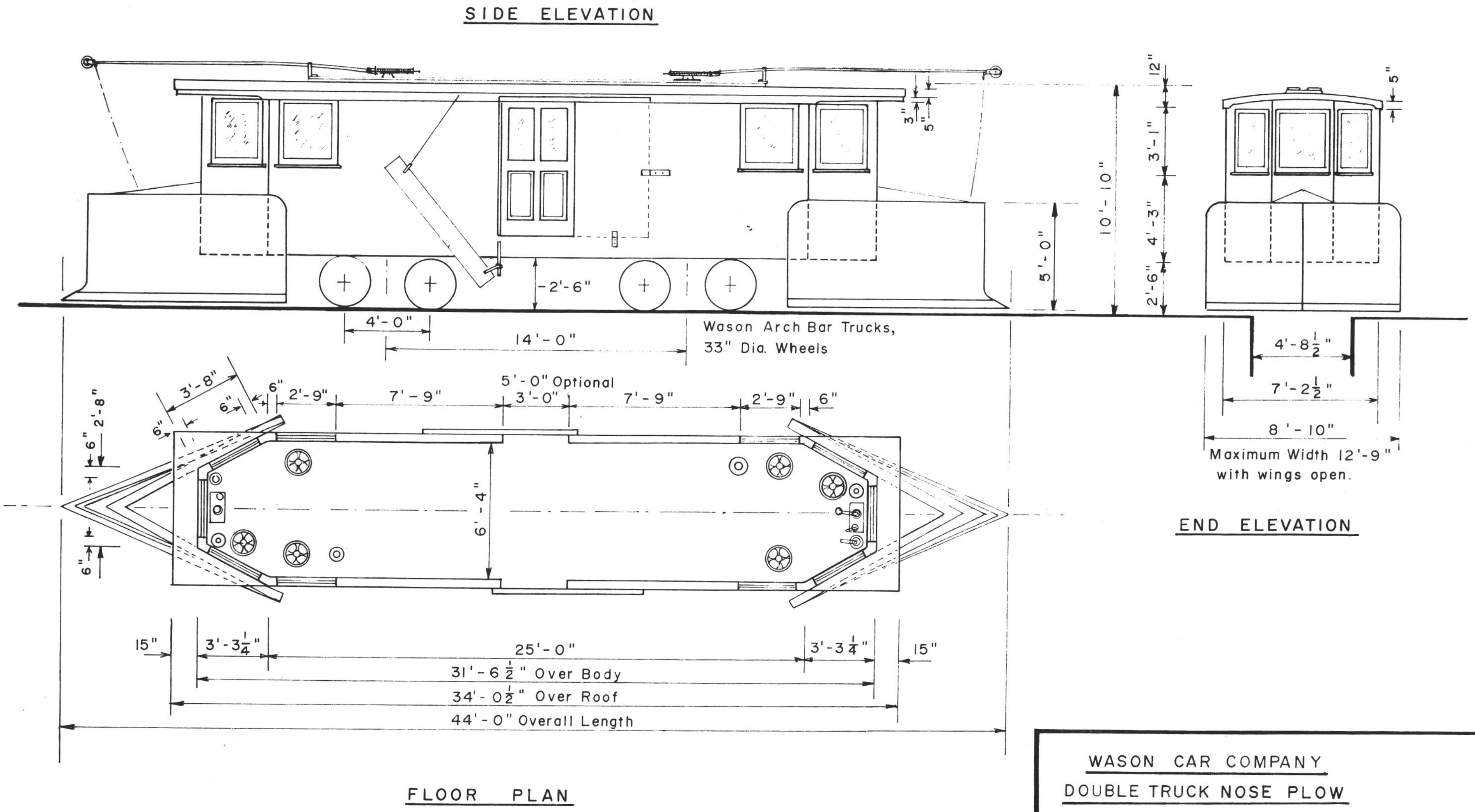

MESABA RAILWAY CO.
101

101


By Aubin, Hibbing

#102

PV119ED
AVERY™


SIDE ELEVATION
12"
5"
3"
5"
10'-10"
3'-1"
4'-3"
5'-0"
2'-6"
-2'-6"
4'-0"
14'-0"
Wason Arch Bar Trucks,
33" Dia. Wheels
4'-8 1/2"
7'-2 1/2"
8'-10"
Maximum Width 12'-9"
with wings open.
END ELEVATION
3'-8"
6"
6"
6"
2'-8"
6"
6"
2'-9"
7'-9"
5'-0" Optional
3'-0"
7'-9"
2'-9"
6"
6'-4"
15"
3'-3 1/4"
25'-0"
3'-3 1/4"
15"
31'-6 1/2" Over Body
34'-0 1/2" Over Roof
44'-0" Overall Length
FLOOR PLAN

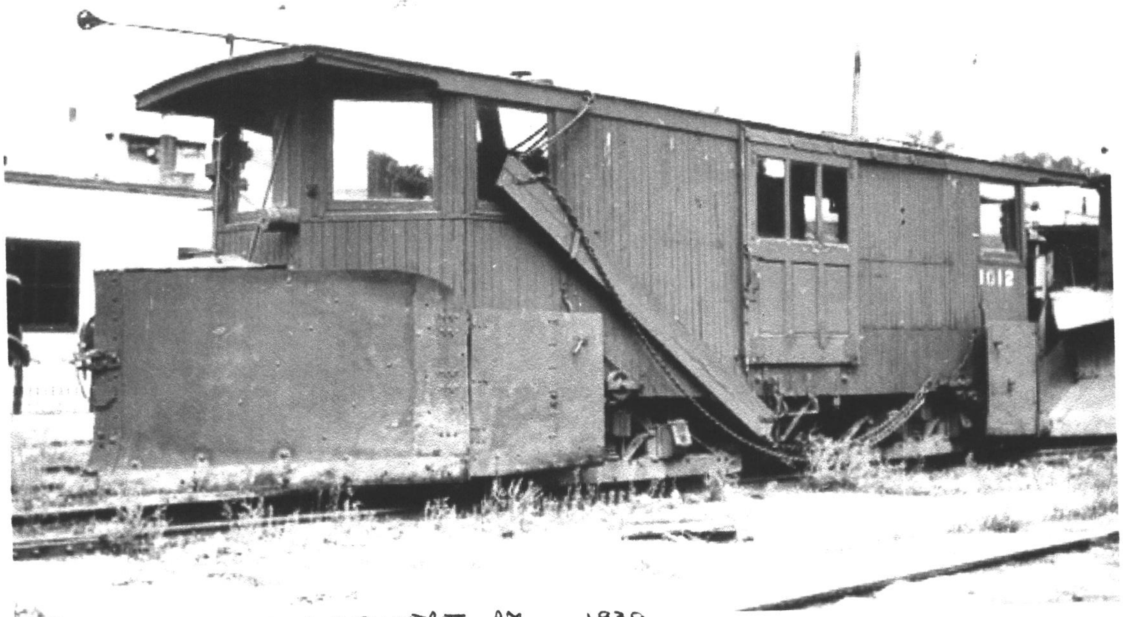
WASON CAR COMPANY

DOUBLE TRUCK NOSE PLOW

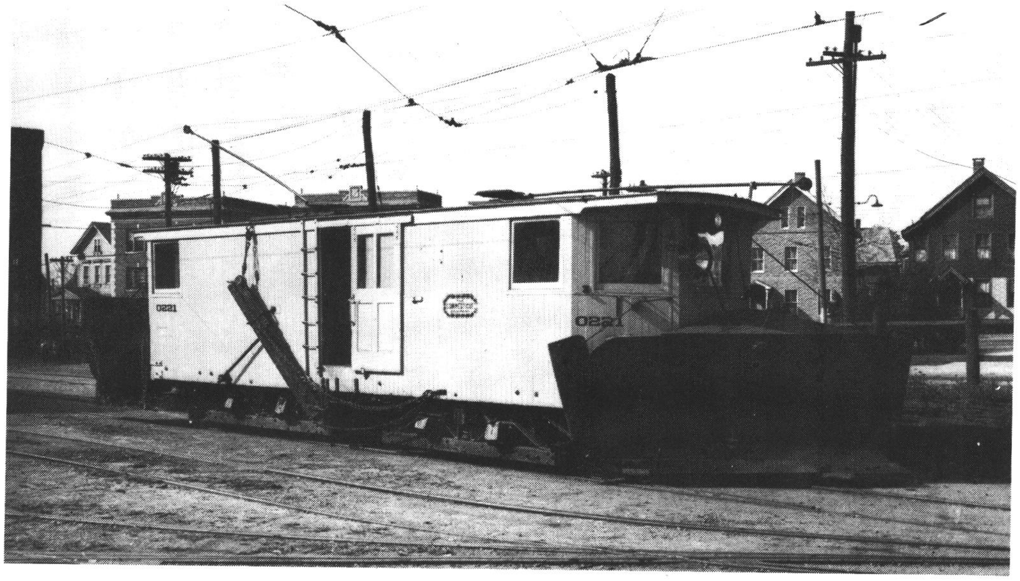
SCALE:

DRAWN BY: A.W.Maginnis - 6/26/91

Source Of Data: J.G. BRILL Co.

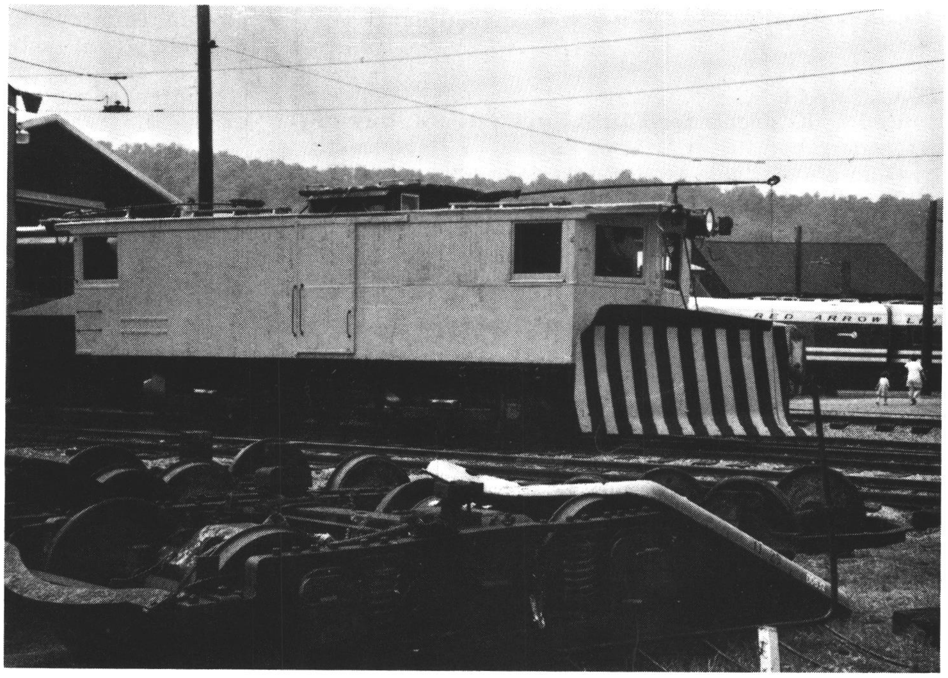


ANDROSCOGGN & KENNEBEC RY. 1939



This Wason shear plow, Connecticut Company #0221, was fresh and clean when photographed without snow in New Haven in 1940. (Stephen D. Maguire, A. W. Maginnis Collection)

In fresh yellow paint and a plow with safety stripes, ex-Philadelphia & Western #10 shear plow was on exhibit at Shade Gap Electric Railway at Orbisonia, Pa. in the summer of 1991. It was built by Wason in 1915. (A. W. Maginnis)



CONTENTS OF THE BACK POCKET

Mesaba Ry
7-24-18

#2 CH 514 G554/600 H756
H800 G954/1000 H1156
H1200 G154/200 H356
H400 G554|600 H756
H800 G954/1000 H1156
H1200 CH 114 (will run to Virginia for psgrs)

#1 V500 B536/538 G654
G700 H856|900 H1054
H1100 G1256/100 H254
H300 G456/500 H654
H700 G856|900 H1054
H1100 G1256|100 C122

Passenger Meets at:
Center
Boulder
Thomas

#3 C534 H556|600 G754
G800 H956|1000 G1154
G1200 H156|200 G354
G400 H556|600 G754
G800 H956|1000 G1154
G1200 CH1241

#EXP V1020① G1056/1101 H150
H201② G456|501 V555
Meets with Passenger cars at
Thomas (2 Psgr 1 Exp)
Runquist
Boulder (2 Psgr 1 Exp)
Center (2 Psgr 1 Exp)

#4 CH541 H656/700 G854
G900 H1056/1100 G1254
G100 H256|300 G454
G500 H656|700 G854
G900 H1056|1100 V1220

① 2nd section of psgr run out of Hibbing at 900AM
② waits at Virginia Y to follow psgr run to Gilbert

Mesaba Railways

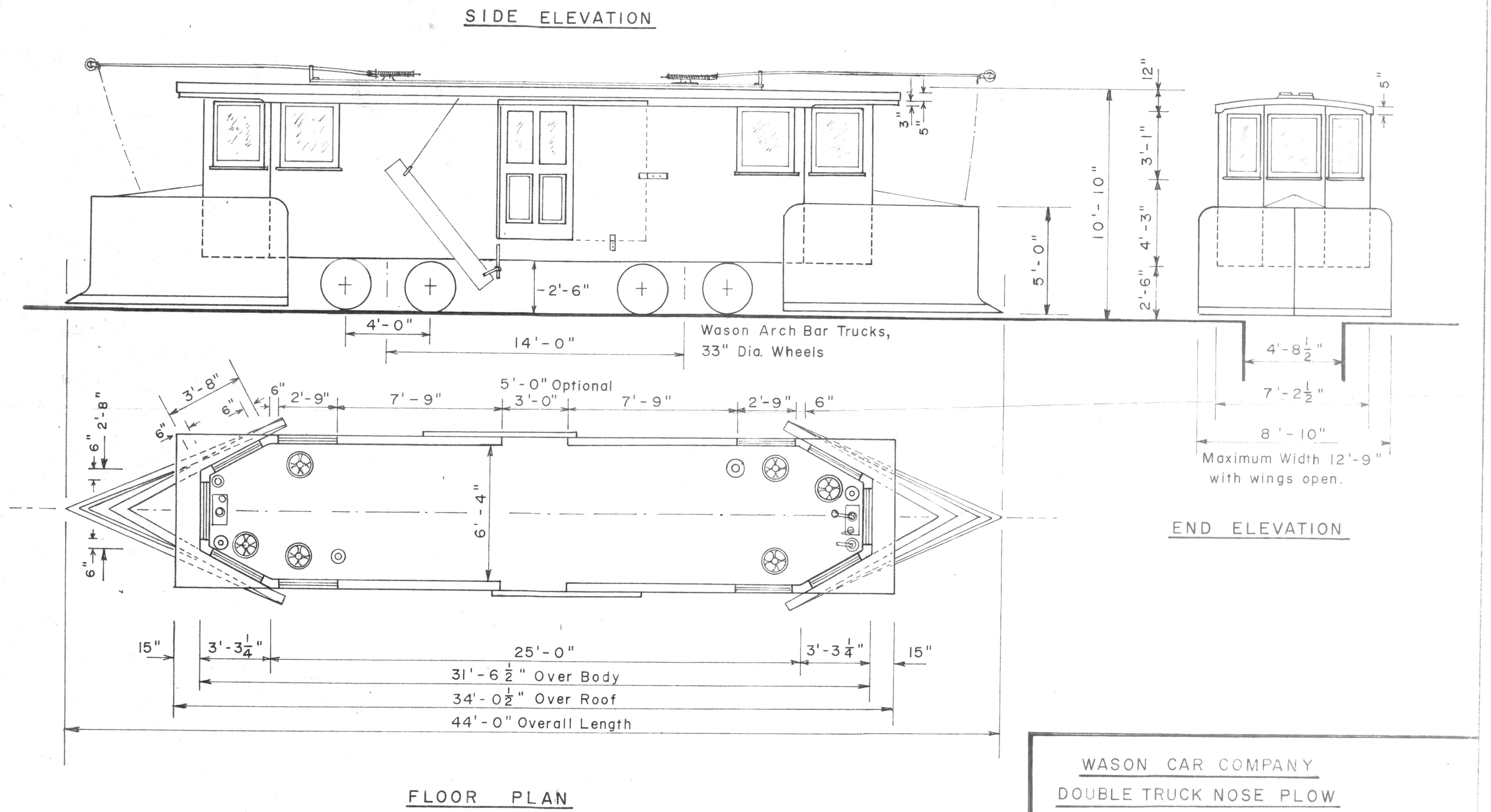
7-24-1918

© WILSON JONES COMPANY G7504 ColumnWrite ®

	Initials	Date
Prepared By		
Approved By		

MADE IN U.S.A.

Time-table Miles		Length LF	Track Map Miles	EB ▼	WB ▲	WB ▲	WB ▲
0	Hibbing Wye begin track		000	800	856	1056	1056
	Lavinia Siding	360	256	812	843	943	1043
6	Chisholm Wye		?	822	834	934	1034
	Boulder Siding (EB take siding)	360	815	$\boxed{828}$	$\boxed{828}$		
11	Buhl Wye		?	838	820	920	1020
	Runquist Siding	325	1386				
	Center Siding (WB take siding)	360	1926	$\boxed{858}$		$\boxed{858}$	
19	Mountain Iron			902	754	854	954
23	Carhouse		?	914	741	841	941
25	Virginia Wye		?	920	735	835	935
	Thomas Siding (EB take siding)	230	2719	$\boxed{927}$			$\boxed{928}$
	Summit Gravel Pit Spur	?	?				
28	Eveleth Wye		?	942	716	816	916
	Sparta Siding	300	3178				
35	Gilbert Wye end of track		3500	954	700	800	900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WASON CAR COMPANY

DOUBLE TRUCK NOSE PLOW

SCALE: 1/4" = 1'-0"
DRAWN BY: A.W.Maginnis - 6/26/91
Source Of Data: J.G. BRILL Co.